Pests

AND THEIR CONTROL

1944
FEBRUARY
VOL. 12 NO. 2

ORGAN OF THE PEST CONTROL INDUSTRY

Exterminators
Fumigators
Termite Control Operators
Entomologists
Insecticide and Supply Mfgrs.

MONTHLY TIP FROM "TIPPIE" CYANEGG:

Don't handle "Cyanegg" with your bare hands. Wear dry cotton or rubber gloves, or use a metal scoop.

Just a little detail, to be sure, but a mighty important one which should not be overlooked or ignored. The wise operator takes no chances. He observes every precaution for safe handling and safe working.

For instance, besides always wearing gloves or using a scoop in handling cyanide, he never lets this product come in contact with skin wounds or abrasions. He washes his hands thoroughly with running water after handling cyanide. And, he never eats or handles food during cyanide operations.

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After the war is over, the Professional Exterminator will have before him the biggest opportunity of his career. The demand for his services will be greater than ever. He has abundantly proved himself the most vital link in the problem of pest control. His standing as an important public servant has achieved the plane of a respected profession.

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Call on us for your requirements. We shall continue doing not merely our bit, but our *best*, to fulfill them.

J. L. HOPKINS & CO.

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220 Broadway **New York**

Pests

and Their CONTROL

Exterminators, Fumigators, Termite Control Operators, Entomologists, Insecticide and Supply Manufacturers

COOPERATING WITH NATIONAL PEST CONTROL ASSOCIATION

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CONTENTS

"Contributed articles in this publication do not necessarily reflect the opinions of the editors. The editors invite discussions, comments and all types of literary material pertaining to pest control and pests from any person interested in the advancement of the field."

Editorial 4-5

The Purdue Conference 6

Fourth Annual Eastern Pest Control Operators Conference 8

Fumigation for the Armed Forces and the Home Front .. 10
By J. Carl Dawson.

St. Louis Legislation with Reference to the Pest Control Operator 12

Entomological Folklore 13
By Leonard H. Haseman.

Tests With a Pyrethrum Aerosol Against Cockroaches and Stored Product Pests 15
By H. A. U. Monro.

Formulation of Rat Baits 17
By Justus C. Ward.

What's New in Pest Control—Personals 19

Local Organization News 20

Some Aspects of Moisture In Its Relation to Insect Pest Control 21

Additional Patents Relating to Pest Control 26
By Dr. R. C. Roark.

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EDITORIAL

A REMINDER!

OUT of the crisis of war a better perspective of life's verities seems to be emerging. Because their very existence was threatened, things we had always taken for granted and assumed as our "God-given" rights are now being revalued and treasured as never before.

Illustrative of this, and a gentle reminder not only of our good fortune but our obligations as well, are these sincerely phrased paragraphs from a circular of the Hopkins-Mead Co., of Los Angeles, Calif.:

"Ruthlessness has reduced to rubble masterpieces of man's handiwork and marred God's masterpieces in nature's grandeur, to satiate in part the arrogant ego and lust of beastly fanatics, parading in the form of man.

"Hospitals, identified by the red cross of mercy, have been bombed, without compunction but with precision, by planes bearing a cross with broken arms, signifying a broken faith with both God and man of the masters of the Swastika, assisted by the Rising Sun (son) of Satan, motivated by the desire to rule or ruin both man and his domain.

"From time immemorial nations have risen to the pinnacle of power and affluence, there poised in glory and grandeur, till self adoration and ego effaced all else, transforming the nobler and finer to the base and abject, undermining the foundation and breaking down the bulwarks of the home, and as the home fell so did the nation, weakened and subject to plunder, for 'Ill fares the land, to neighboring ills a pray, where wealth accumulates men decay.'

"In contrast, our glorious America, founded on Holy Writ, and nurtured on its precepts, builded for eternity, with an abiding faith in God and country, plus Yankee determination and tenacity, untrammeled with tolerance or fanaticism, will grow in stature to greatness, tempered with humility, with the resolve to lead, not dominate, offering an asylum to the oppressed, with liberty and justice for all.

"Can any true American, whether by birth or adoption, be lax in gratitude? Should not each devoutly pay homage to a gracious God for the plenty that surrounds us and the freedom that is ours? Should not each of the 133,000,000 freemen, with fervor sing, 'Praise God from whom all blessings flow.'"

It Happened in a Town in the Middle West!

WHEN, as happened recently in a town in the middle west, one PCO refers business to another, that, as the recipient PCO reminds us, is news indeed!

And, by way of explanation he adds:

"A few days ago a fellow operator felt that with the shortage of servicemen he could not give the proper service to a dairy and ice cream manufacturer whom he had been servicing for many years.

"When we got the call from the superintendent of the dairy and ice cream plant, he told us outright who was servicing the buildings and also that we had been recommended by our friendly competitor.

"At the superintendent's request we surveyed the two buildings and found a very bad roach infestation. The condition of the buildings being what it was we were compelled to quote the comparatively high clean-out price of $500. Nevertheless, the job was worth every penny of it. Our quotation accepted we started work immediately.

"Copy of our quotation, and the conditions under which we would take the job, were sent to our friendly competitor, along with a copy of this brief.

"YES! . . . IT HAPPENED IN A TOWN IN THE MIDDLE WEST."

Congratulations to these PCOs for the friendly, cooperative spirit manifested. Knowing the PCO, who sent us the foregoing, as we do, we are sure he wouldn't hesitate, under comparable circumstances, to do as he was done by.—Ed.

Real Estate Board Adopts Standard Pest Control Clause

A MOVEMENT by a real estate board to encourage termite inspections of properties is news. While real estate operators have gradually come to accept the structural pest control problem as a necessary evil, the recent action of the Berkeley Real Estate Board is adopting a standard clause for use in real estate transactions represents a long step toward full cooperation between real estate firms and pest control operators.

The clause, worded as follows, has been put on rubber stamps which have been distributed to Berkeley real estate dealers:

> PROPERTY TO BE EXAMINED BY A LICENSED PEST CONTROL INSPECTOR AT THE EXPENSE OF THE BUYER. ANY WORK TO REPAIR DAMAGE FROM INFESTATION OF WOOD DESTROYING ORGANISMS OR TO CORRECT CONDITIONS THAT CAUSED INFESTATION TO BE DONE AT THE EXPENSE OF THE SELLER. FUNDS FOR SUCH WORK TO BE HELD IN ESCROW AND DISBURSED UPON CLEARANCE BY INSPECTOR.

Berkeley real estate operators have had an unusual opportunity to study and progress of structural pest control since the Pacific Pest Control Conference has been held each year at the University of California. Several realtors have attended these meetings and at one session Maurice Read, who at that time was president of the Berkeley Real Estate Board and a director of the California Real Estate Board, addressed the conference regarding common problems.

The committee which worked out the final wording of the clause consisted of two real estate operators, two loan institution representatives and two pest control operators. This meeting followed a breakfast meeting of the Berkeley Real Estate Board at which local operators were invited to be present.

Study of the accepted wording of the clause will indicate how the following questions were handled:

1. Who is to pay for the inspection? Why?
   A. The buyer, because the inspection is for his protection and he wants his own inspector.

2. What is the measure of work to be done?
   A. Only in cases of actual infestation or damage from fungus, termites or beetles ("wood destroying organisms" was the term preferred by the real estate operators) is control work called for. Whatever reconstruction and treatment is required to repair damage done and give reasonable protection against future damage is included. Sunken foundations, structural faults and the like are not considered a part of the agreement, nor are soil contacts, debris and other conditions which are likely to cause infestation but of which there is no present evidence.

3. Who pays for the work?
   A. The seller. It is presumed that the price which he has set on his house is based on the assumption that it is free of infestation and damage.

4. What provision is made for concluding the deal promptly in case there is considerable work to be done, or that the work cannot be done immediately?
   A. Funds from the deal are to be held in escrow. This allows the new owner to take possession and all formalities connected with deal to be concluded.

5. Who is to decide when the work is completed?
   A. The licensed operator. This naturally implies a feeling of confidence in local operators and in the operation of the Structural Pest Control Law which governs their activities. It is up to the operators to create and preserve this confidence.

While it is not expected that real estate operators will use the pest control clause in every deal, in those cases where inspections are called for, the uniform wording is expected to avoid the frequent misunderstandings of the past where the variety of clauses used have created endless confusion. The trend toward cooperation is to be commended.—C.P.C.M.

Recent News Apropos "DDT"*

(Dichloro—Diphenyl—Trichloroethane)

ALL PRODUCTION of "DDT" being limited to the Army and Navy, except for laboratory experiments, much of what is known as to its insecticidal properties must remain a military secret. However, of co-related and human interest—and post-war commercial promise, too—are some end uses of this much-discussed insecticide which appeared in a "Philadelphia Record" news item of recent date:

"The Armed Forces disclosed today [January 1] they have a new and powerful chemical against body lice, the carriers of typhus fever.

"Moreover, the anti-louse chemical, in experimental tests, rendered a room destructive to house flies for a period of three months.

"Researchers of the Agriculture Department have employed it ["DDT"] successfully against 40 to 50 different pests from Japanese beetles to bed bugs, and from livestock lice to termites.

"Army medical-department scientists declare the material—used for the first time on a mass scale in the North African campaign has proved more effective against body lice than any insecticide previously used. It is used in the form of a powder, and a single application to clothing provides protection for a month.

"The army has devised techniques of applying the new louse powder to underclothing with special hand and powder dusters, without necessitating the removal of clothing, as heretofore.

"It also can be used in a special solution for impregnation of underwear.

"Clothing so impregnated will remain free of lice for as long as two months even though it is laundered once a week during that time.

"The material now is being manufactured by Geigy subsidiaries in this country and by the duPont Company."

*See p. 17, *October* (1943) *Pests for additional information on "DDT".*

Safety, the Most Important Factor in Fumigation Work—Accidents Can and Must Be Prevented

THE VOLUME of fumigation work has increased considerably in recent years and while we do not know of any accurate record of fumigation accidents for, say 10 years back, which would show the ratio of accidents in proportion to the amount of work, we have the impression that there have been fewer accidents in recent years. Nevertheless, the number of accidents occurring each year are still large and considering the fact that an analysis indicates that each one is due to failure to observe one of the cardinal safety rules, it follows that more careful observance of these safety rules will have the effect of cutting down accidents. In fact, it is not too much to expect that by rigid adherence to fumigation safety rules, fatalities can be eliminated altogether.

There may be a tendency in some quarters to philosophize that by the law of averages, increased fumigations mean increased accident hazard—that such a condition is in the nature of things. That, however, is faulty reasoning and obviously should not be the attitude of responsible Pest Control Operators. It is certainly a disastrous attitude to take in this business.

Fumigation accidents **can** definitely be prevented and there is no more important part of the business to which the Pest Control Operator should devote himself than a frequent, careful, and thorough check-up within his own organization to be sure that **all** of the safety rules are observed **all** of the time.

Fumigation accidents can and must be prevented. This is in the interest of future development of the Pest Control Industry.

—Discoid News Bulletin.

Supply Outlook

CHLOROPICRIN—adequate.
CRESOLS AND CRESYLIC ACID—adequate.
CYANIDES—adequate or better.
METHYL BROMIDE—adequate.
NICOTINE—plentiful. Available for extensive use as substitute or alternate.
OILS, SOLUBLE AND SPRAY—adequate or better.
PARADICHLOROBENZENE—tight to adequate.
PHENOLS—adequate.
PYRETHRUM—armed forces expected to continue using almost all the production. Substitutes and extenders must be used to the limit.
ROTENONE—tight, except for certain permitted uses. Situation somewhat easier than past year, as Latin American production slowly increases. List of uses expanded, though still narrow. Water transportation is indefinite and may affect this forecast.
SULFUR—supplies should be adequate, but particularly subject to manpower bottlenecks.
TARTAR EMETIC—plentiful.
THIOCYANATES—plentiful. Available for wide use as extenders.
ZINC COMPOUNDS—adequate.

THE PURDUE CONFERENCE

THE ACCOMPANYING illustration was on the frontispiece of the 8th Annual Pest Control Operation Conference program, held at Purdue University, Lafayette, Indiana, January 17-20. With it was a slogan which every pest control operator might well take to heart. It read "Let's put something on the ball, and make a strike on every call".

The Eighth Annual Conference was a notable success, both in attendance and in subject matter.

The Monday daytime session included the fundamentals, given by the Purdue Entomology staff, including Professors J. J. Davis, H. O. Deay and B. E. Montgomery.

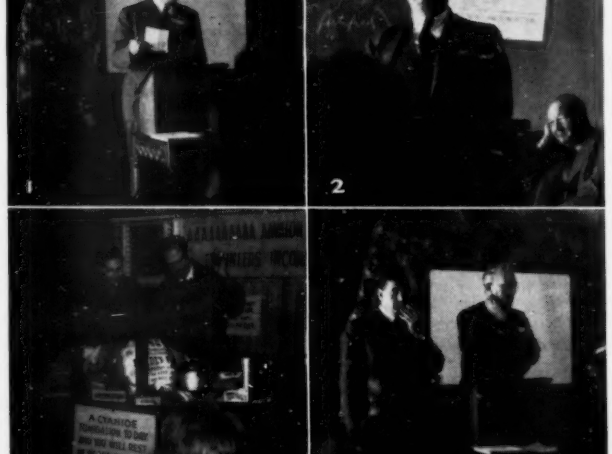
The Monday evening sesion was a Melodrama entitled the Termites Doom, written and directed by Ira Hatfield. The play consisting of four scenes, vividly took care of the 1, 2, 3, 3½ principles of termite control. Those taking part included Walter S. Gibson, J. Harvey Sturgeon and Arthur Ochs.

The Tuesday morning session dealt entirely with termite problems and included a chalk talk on the biology of termites by Glen Lehler of the Purdue Entomology staff, a demonstration on the treating of timbers in place with chemicals by Theodore Oser and Bert Lewis and discussion of the 1-2-3-3½ princples of termite control by Arthur Ochs, B. C. Scherzinger and George L. Hockenyos.

Tuesday afternoon was given over entirely to fumigation problems, the first half of the session dealing with specific types of fumigations discussed by Herman Militzer, J. R. Franklin, V. E. Thomas and Max Rukin. Following the specific fumigation problems, representatives of manufacturers of fumigants, including George H. Chapman, C. A. Vincent-Daviss, J. Carl Dawson, Chas. W. Houghton, and C. C. Johnson, answered questions which had been prepared and which represented inquiries often brought up by commercial fumigators.

The meeting Tuesday evening held in the Purdue Memorial Union was most interesting. George Elliott, President of the N.P.C.A. opened the discussion on "Elusive Irritations", referring to those difficult problems of Insectaphobia or Insect Hallucinations, which so frequently confront the pest control operator. The evening session closed with a discussion of relapsing fever by Dr. H. C. Whitmire. Dr. Whitmire also showed a movie on ticks and G. C. Oderkirk showed the new colored films on rats and rat control prepared by the Fish and Wildlife Service.

The Wednesday morning meeting provided much information of value to all pest control operators. Ira Hatfield presented an able discussion of the powder post beetles, followed by a fine presentation by Dr. W. E. Dove dealing with post-war problems which will confront pest control operators. Incidentally Doctor Dove, who is in charge of investigations dealing with insects attaching men and animals of the U. S. Bureau of Entomology and Plant Quarantine, demonstrated the aerosol bombs which are now being used by men in the armed forces and which will doubtless play a major part in household insect control after the war. Following Doctor Dove's talk and demonstration Dr. H. G. DeKay, Professor of Pharmacy of Purdue University, demonstrated the Shafer Prone Method of Resuscitation.



Snapshots taken at the Purdue Conference and furnished through the courtesy of John K. Medoff, J. Edwin Sameth and Jerome Straus.
1—Bill Buettner; 2—C. A. Vincent-Daviss, our "Bill Dupont"; 3—Messrs. Medoff and Wimmer; 4—Bill Buettner and Dr. C. P. Alexander.

Eighth Annual PCO's Conference at Purdue University, January 17, 18, 19, 20, 1944.

Wednesday afternoon was given over entirely to rat control and was under the direction of Galen C. Oderkirk. Those who participated included B. C. Culver, G. L. Clem, Frieda Schicht, J. Harvey Sturgeon, Harlem B. Ives, Max Rukin, George Dyar, W. O. Buettner, and Martin Meyer. A feature of the rat program included bio-assay tests demonstrating the importance of the mg/kg principle of rat control.

The annual dinner was held Wednesday evening at the Fowler Hotel. In as much as President Edward C.

Elliott of Purdue was unable to remain throughout the dinner session because of other engagements, Dr. H. K. Stechel acted as toastmaster. Speakers included President Elliott, M. A. Sanderson, George Elliott and Frank Hall. Frank Hall, Professor of History at Purdue was the guest speaker and gave all who attended, much to think about in his talk on post-war problems.

The Thursday program included a variety of problems. William O. Buettner explained the problems of material and man-power priorities; Lt. Col. F. C. Mortensen discussed pest problems of the Army and Carl E. Weinman talked on a research program for the pest control industry. C. A. Vincent-Daviss and George K. Foresman provided demonstrations illustrating certain chemical principles which have a direct relation to pest control procedures, a continuation of the demonstrations given at the 1943 conference.

Thursday afternoon B. G. Berger of the University of Illinois discussed some interesting problems received from the public, followed by a discussion of spider control by Morten Prescott and new method of roach control by George E. Gould. The program was concluded with an excellent colored movie "Guardians of Plenty" provided by the du Pont Company.

Following Doctor Deay's discussion of insect classification on Monday afternoon, a test was provided, resulting in nine completing it with perfect scores.

Another and more comprehensive test was provided, consisting of 200 true and false questions, multiple choice questions, and completion test questions. These were handed out the first day of the Conference, but because of time limits a complete report and analysis cannot be made of this test.

This Eighth Annual Pest Control Operators Conference can be said to be the most successful to date with 160 persons in attendance, representing 19 states and Canada. Fifty-seven were in attendance for the first time and five, C. Norman Dold, Jules B. Smith, W. O. Buettner, Harlem B. Ives and W. W. Scott, were in attendance for the eighth consecutive year.

The Purdue PCO Student Loan Fund was materially increased during the past year. Two operators each contributed $100.00 during the year and the conference contributed $334.00. The total in this fund is now $1,743.73.

FUMIGATION NEWS

Published in the Interest of Pest Control Operators by the Insecticide Department of
AMERICAN CYANAMID & CHEMICAL CORPORATION
(A Unit of American Cyanamid Company)
Kansas City, Mo. • 30 Rockefeller Plaza, New York 20, N. Y. • Azusa, Calif.

THOROUGHNESS AT EVERY STEP —THE ONLY WAY TO INSURE FUMIGATION RESULTS

To obtain the utmost effectiveness in the destruction of bedbugs, cockroaches, carpet beetles, clothes moths and similar insects, the Pest Control Operator should check the following steps and conditions *prior* to every fumigation:

1. Be sure of the cubic measurements—no guesswork here.

2. Do a complete sealing job from cellar to attic, particularly where the infestation is carpet beetles.

3. Use enough gas. Hydrocyanic acid (the active ingredient in ZYKLON DISCOIDS) is one of the most economical and effective fumigants on the market, but it cannot be expected to do the impossible. When in doubt, use more than the normal dosage; that will be cheaper than having to repeat the job and it protects your reputation for effective work.

4. Allow plenty of time. A relatively long exposure is preferable, especially where the gas must penetrate heavy rugs, hangings, closets full of heavy clothes, rooms, basements and attics loaded with furnishings.

5. In the case of carpet beetles, be sure to use a vacuum cleaner on all carpets and rugs before fumigation and in addition, elevate rugs and carpets—hang them over chairs—to facilitate gas penetration.

6. See that the building is well heated before, during and *after* fumigation until it has been thoroughly ventilated. This is necessary in the cold weather for effective fumigation results and, more important, for complete aeration of the fumigated premises and furnishings.

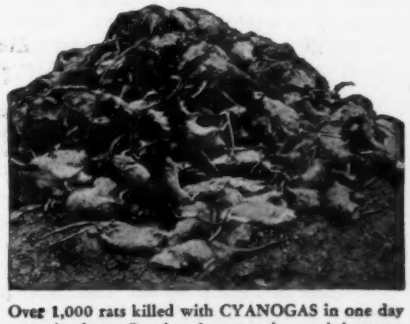
KEEP AMPLE STOCKS OF ZYKLON DISCOIDS & CYANOGAS ON HAND

The wartime effect on labor and transportation makes it more important than ever for the Pest Control Operator to watch his stocks. It is virtually impossible today to get "same day" shipments, and rail and truck transportation cannot be counted upon to perform "on schedule." Allow for these conditions. Order ahead. If you use a few cases out of your stock of several on hand, immediately order replacement. With this margin of safety, you will always be in a position to handle your regular business, as well as to capitalize on last-minute jobs.

EFFECTIVE COMMUNITY CONTROL OF RATS IS A CONTINUAL AND COOPERATIVE JOB

Rats are always on the move. They travel from farm to farm, from building to building till whole communities are literally crawling with them. Any single unit can be easily freed of rodents with CYANOGAS, but it will soon be reinfested if similar control measures are not adopted on adjoining premises. To wage a successful war on rats, cooperative control plans can be put into effect by Pest Control Operators working hand-in-hand with municipal officials and health authorities.

In the United States and Canada and fifty-five other countries the efficiency of CYANOGAS is well known and its use approved by government agencies. The secret of CYANOGAS' success is that the rats merely ***breathe*** the gas and they are killed instantly. They need not eat it—rats can smell out what's not good for them; they need not touch it—rats have a way of "walking around" lethal traps. But rats must breathe and that is how CYANOGAS does its "killing" job. Alert Pest Control Operators everywhere are using CYANOGAS to rid communities of these dread rodents.



Over 1,000 rats killed with CYANOGAS in one day on a city dump. Results of cooperative work between City of Tacoma, Wash. and U.S.D.A.

Fourth Annual Eastern Pest Control Operators Conference

THE FOURTH Annual Eastern Pest Control Operators Conference was held at Amherst, Mass., January 10th, 11th and 12th, under the auspices of Massachusetts State College, in cooperation with the National Pest Control Association. The attendance of 109 is significant because more pest control operators attended this Conference than previous conferences. The Conference was opened in Farley Clubhouse on Monday. Registration took place under the supervision of F. E. Bohman, Treasurer of the Conference.

There followed a splendid address of welcome delivered by Dr. Hugh P. Baker, President of Massachusetts State College. The balance of the first morning session was devoted to the reading of highly informative papers on "Weights and Measures" by Milford Oachs, "Plant Materials as Sources of Insecticides" by T. Roy Hansberry of Cornell University and "Pest Control and Pest Control Training in the First Service Command" by Lieutenant Donald De Leon, U. S. Army.

One of the high lights of the Monday afternoon session was a skit entitled "Mr. Careful and Mr. Careless", written, ad libbed, produced and performed by those engaging and amazing thespians John K. Medoff, Sidney Wimmer, Ernest M. Mills and Fred Bowers. Not only was this skit highly amusing, but contained food for thought, contrasting, as it did, proper and improper methods of conducting a pest control business. The acting of all four members of the cast was extremely effective, and the skit was received with hearty laughter and applause.

This session which was under the chairmanship of Stefan M. Rhodie also featured a Rodent Control Program conducted by George B. Lay, Ernest M. Mills, Robert M. Borg and Leonard R. Parkinson, all of the U. S. Fish and Wildlife Service.

A graphic demonstration of the standard method of bio-assaying red squill, as part of this program, proved conclusively that using the proper mg/kg toxicity of red squill was a necessity and that present shipments of red squill, unless fortified, are practically useless. These findings were based on tests made on rats which were fed red squill, ground from recent shipments, in proportions of 10% and 20%, with all rats surviving. Whereas a fortified red squill, made out of this same powder, ranging from 500 to 600 mg/kg, killed all the rats that were fed within 24 hours. Conducting this excellent, fact-finding demonstration were Messrs. Mills and Parkinson, ably assisted by Herb. Meyers and Steve Rhodie.

Two important papers were read Monday afternoon, "The Importance of a Research Program in the Pest Control Industry" by Charles E. Palm, head of the Department of Entomology of Cornell University, and "Research Projects with Emphasis on Moths',, by J. Edwin Sameth. An evening session at Fernald Hall lasted until the stroke of midnight.

This program under the chairmanship of George R. Elliott, President of the National Pest Control Operators Association comprised a lively discussion of "Elusive Irritations" during which an address on the subject was given by James D. Wails, M. D., Health Commissioner of the city of Worcester, Mass. The balance of the program consisted of further phases of Rodent Control together with a fascinating motion picture "Vandals of the Night" produced with sound effects by the U. S. Fish and Wildlife Service.

Tuesday was devoted chiefly to laboratory work at Fernald Hall under the direction of C. P. Alexander, H. L. Sweetman, A. I. Bourne, W. B. Becker, and a corps of efficient assistants. This work involved identification of insects and of the damage caused by insect depredations. An interesting demonstration of electric fly screen equipment was given by the Detjen Corporation. Two important papers were read at the afternoon session, "Species of Blowflies" by Dr. Charles H. Blake of the Massachusetts Institute of Technology, and "Protection of Buildings from Termite Damage with Special Reference to Wartime Conditions," by Neely Turner of the Connecticut Agricultural Experiment Station.

On Tuesday evening the annual banquet was held at the Lord Jeffrey Inn. After a hearty dinner was served, the diners were enthralled by an inspiring address by President Baker on the subject of "Building a New Profession". During the course of the banquet tokens of appreciation were presented to President Baker, Dr. F. J. Sievers, Director of the Massachusetts Agricultural Experiment Station and a substantial check to be added to the entomological student's loan fund was presented to Dr. Alexander. These presentations were but a small token of the appreciation of the Association for the cooperation of the College faculty in making the Eastern Conferences so successful.

At the Wednesday morning session the topic was Fumigation. This meeting was led by Bartlett W. Eldridge and included the analysis of specific fumigation problems by George H. Chapman, C. A. Vincent-Daviss, J. Carl Dawson, Charles W. Houghton and Conrad C. Johnson.

Fourth Annual Eastern PCOs Conference held at Massachusetts State College, Amherst, Mass., January 10, 11, 12, 1944.

The concluding afternoon session was begun with an interesting talk on Chemistry by C. A. Vincent-Daviss, during the course of which Mr. Daviss conducted some fascinating experiments. The Conference concluded with a discussion of present day problems led by William O. Buettner.

It was heartily agreed by all those who attended the Conference that much valuable information was obtained from the diversified discussions. The genuine profit accruing to all present is beyond accurate assay. The consistently high yearly attendance of so many Pest Control Operators is proof of the value of the papers read and the laboratory work done at the sessions. In no other way can the Operator obtain in so short a time so much information necessary to his business.

Conference Notes

For the personal sacrifice entailed on their part in preparing the necessary material for the Conference program, thereby contributing materially to its success, a special vote of thanks is due Professor Bourne, Doctors Alexander, Sweetman, Smith, Becker and others of the Massachusetts State faculty.

Dr. Chas. H. Blake of M.I.T. may still get his hair cut if Bill Buettner succeeds in raising the necessary funds.

Pres. H. P. Baker, M.S.C., was guest speaker at the banquet. The four-point program outlined in his talk, "Building a New Profession", was most favorably received, if the subsequent discussion it stimulated is any criterion,—and it is.

The theme "The Need of a Research Fund sponsored by Pest Control Operators was elaborated upon by Dr. C. E. Palm of Cornell University and J. Edwin Sameth.

The pupils are becoming the teachers. Attesting to this were the excellent papers delivered by PCOs Milford Oachs, Ozane Exterminating Co., and J. Edwin Sameth, Western Exterminating Company.

An absorbingly interesting talk on "Chemistry" by C. A. Vincent-Daviss of the E. I. du Pont de Nemours & Co., Inc., during which he performed some unique experiments, proved a highlight of the Conference.

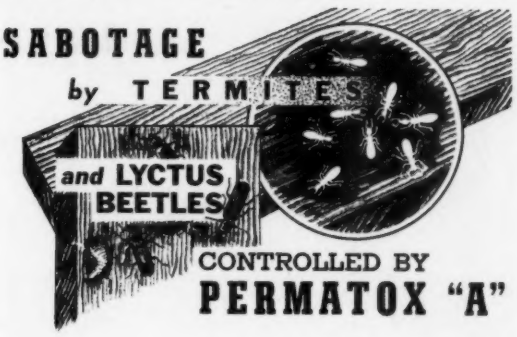
Sodium Fluoride As An Ant Control[1]

F. F. BIBBY *and* J. P. SECREST, *U. S. Naval Hospital, Pensacola, Florida*

Sodium fluoride exceeded expectations by far as a control measure against ants at the U. S. Naval Hospital, Pensacola, Florida, during May and June, 1943. It did all that was promised in Leaflet No. 147 of the U. S. Department of Agriculture and many times more. Applied as a dust to the surface of and slightly within many nests of **Pogonomyrmex badius** (Latr.),[2] **Solenopsis geminata** (F.), **Dorymyrmex pyramicus** (Rog.), **Dorymyrmex pyramicus** var. **flavis** (McCook), **Pheidole dentata** (Mayr), and **Paratrechina longicornis** (Latr.) by means of a small bellows duster, sodium fluoride gave complete control in every instance usually within a day or two with only one application. The success and simplicity of this method indicates that sodium fluoride might well be substituted for fumigants in ant control.—6-18-43.

[1]Approved for publication by Capt. W. W. Hargrave, Medical Officer in Command, U. S. Naval Hospital, Pensacola, Florida.

[2]Determination of all species mentioned was by Dr. M. R. Smith, Division of Insect Identification, Bureau of Entomology and Plant Quarantine, Washington, D. C.



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Fumigation For The Armed Forces and The Home Front

By **J. CARL DAWSON**, *The Dow Chemical Company, Midland, Michigan*

Editor's Note: This paper was read by Mr. Dawson at the NPCA Meeting, St. Louis, Mo., October 26, 1943.

THIS DISCUSSION of the subject will be confined to its relationship to the fumigants manufactured by the company I represent. So that it may be understood at the outset, the compounds that will be considered are listed as follows: Ethylene Dichloride, Propylene Dichloride, Carbon Tetrochloride, and Carbon Bisulphide, all used in grain fumigant mixtures as well as for other purposes; Methyl Bromide and Chloropicrin for space, bulk grain and soil fumigation; and Isopropyl Formate for packaging line fumigation.

The first serious fumigation problem brought on by the war occurred in midsummer 1941. At that time, under the Federal Ever Normal Granary program, there had accumulated in storage many millions of bushels of all types of grain. It had been the practice in the past to fumigate this grain in commercial storage with various proprietary name materials. The grain held in the country in the small steel bins had been fumigated with a mixture of 75% Ethylene Dichloride-25% Carbon Tetrachloride, sold by my company under the trade name **Dowfume 75.** It became apparent at that time that the shortage of chlorine would not permit a sufficient supply of this material to fumigate the vast stores of grain on hand. Fortunately, both commercial and Governmental test fumigations had been underway with the same mixture, to which had been added 10% Methyl Bromide. These experimental fumigations were speeded up and within a short time, it was found that this mixture containing Methyl Bromide would require only 1/3 as much of the chlorinated fumigant materials per 1000 bushels of grain. This new mixture was therefore adopted and used on many millions of bushels of grain, with extraordinarily successful results. This problem has now largely passed, because of the consumption of a large part of the grain surplus. Methyl Bromide made a great contribution to the war effort in making it possible in saving the grain stocks, which are so badly needed now.

When we read the history of wars, we are always impressed with the great number of times human disease has been responsible for the defeat of armies. It is also surprising to note how often insect vectors have been responsible for the spread of these diseases. History is full of references to bubonic plague, yellow fever, malaria, and typhus.

There are, of course, a number of ways of controlling typhus fever, primary of which is the control of its vector —the human body louse, commonly called the "cootie". Veterans of World War I tell many stories of "reading" their shirts and of delousing stations located far behind the lines where their clothing was deloused in huge, heavy steam sterilizers. Their apparel emerged damp and with accordion pleats that seemed never to come out. They would shrink, so that a shoehorn was needed to put them on.

With the advent of World War II, the army desired to improve on this method of delousing and requested the Federal Bureau of Entomology & Plant Quarantine to attempt to find a fumigant and a fumigation method that would meet their requirements. A fumigant was desired that would be rapid in action, non-injurious to clothing and equipment, effective at low temperatures, not too dangerous to handle and without undesirable post-fumigation residues or unpleasant odors. In comparative tests with a great many fumigants, **Methyl Bromide** was the only one found to meet all these requirements. The fumigation could be accomplished with a 30-minute exposure period. The clothing and equipment were not injured by the gas. It was shown to be relatively safe, when proper precautions were observed in its use. U. S. Public Health Service tests showed that clothing could be worn directly after fumigation, without skin irritation or injury from inhalation.

Two methods of fumigation were developed to meet specific army needs. The first is a portable, knock-down fumigation chamber that could be used in connection with a portable delousing station, which includes not only delousing, but laundry, showers, and medical inspection. This chamber is built of plywood, with top, sides, bottom, and ends as separate panels to be bolted together. All operational equipment is attached to the back panel, while the front panel acts as a door. The equipment, therefore, is light in weight and requires only a minimum of space while being transported.

Prior to the war, The Dow Chemical Company had developed a plastic-treated cloth that was practically gastight and which had been introduced into commercial use as a Methyl Bromide fumigation tarpaulin. This same material was used to make a fumigation bag, designed to hold one soldier's uniform and blanket. The soldier simply places his equipment in the bag and includes a glass ampoule of Methyl Bromide. The bag is closed by folding over the top edges three times and securing the folds by tape ties. The glass ampoule is then located and broken by stepping on it. In 30 minutes, the bag may be opened, the clothes removed and immediately worn. This development of Methyl Bromide for delousing of soldiers' clothing has been a great contribution to the war effort, not only from the standpoint of preventing an outbreak of typhus fever, but also in keeping up morale.

With our entry into World War II, it became necessary to supply our fighting fronts half way around the world. We also found it necessary to supply our allies across the seas with food, so that they might continue resistance. Shipping space was at a premium, so that conservation of space and weight was of utmost importance. This brought about the dehydration of many food products, so that they could be shipped as dry products, rather than in the customary more natural state in tin cans or similar containers. Dry food products are generally susceptible to insect infestation. Because of the long haul to these far-distant points, serious infestation could develop en route. It is necessary that the product being shipped be

free from insect infestation in any stage and that it be packed in a container as resistant as possible to re-infestation. To keep infestation down in finished products, it is necessary to keep processing plants as free as possible of infestation. Methyl Bromide and **Chloropicrin** have contributed a great deal in keeping the processing plant infestation under control.

Methyl Bromide has been particularly valuable in the fumigation of the finished food product. In a large number of cases, it has been possible to fumigate such products fully packed and ready for shipment. Its extraordinarily high penetrating power enables it to penetrate these packages and the food contained therein and insures not only the food being insect-free, but also the entire lot or shipment. When such shipments leave the country entirely free of infestation, little or no infestation may be expected to develop en route to our soldiers or our allies.

At the present time, the lack of knowledge on the part of commercial fumigators throughout the country of the proper methods of handling Methyl Bromide is seriously handicapping this most valuable contribution to the war effort. Food is becoming more and more scarce every day and it is becoming constantly more important that fumigators inform themselves concerning these methods. It is an unfortunate fact that commercial fumigators who have been in the business for years, seem to find it more difficult to perform Methyl Bromide fumigations than those who have had no previous experience. We are all creatures of habit and it has been our observation that fumigators invariably attempt to use Methyl Bromide by the same methods that they have used with some other fumigants with which they are familiar.

I would like to impress upon you the importance of forgetting all your previous experiences with other fumigants when you use Methyl Bromide. Follow the directions that are given in the various pamphlets on its application. Remember that its properties are not like any other fumigant commonly in use. Very little equipment is required to handle it, but that which is necessary is most important, so avail yourself of it before you start to fumigate. It is inexpensive.

A comparatively new material now beginning to attract wide interest is **Isopropyl Formate,** which has been used extensively for packaging line fumigation in the dried food industry along our West Coast. Equipment is placed in the packaging line that automatically injects into each package a measured dose of this fumigant. It diffuses throughout the package and eliminates insect infestation and in due time, will completely disappear from the product. It is just now being brought into use for the fumigation of other types of food products.

These are only a few developments in the field of fumigation and pest control. New materials and methods are constantly being developed, some of which are available now only to the armed forces. These new materials and methods are contributing a great deal to the winning of the war. When the war is over, they will be released to the public. It behooves us all to keep abreast of these developments.

RATS START A CHRISTMAS FUND

Memphis (AP)—Mrs. Dora Peters's $113.56 in Christmas savings disappeared last month.

Yesterday a $5 bill turned up under a sidewalk in the back yard.

Further investigation led to all except $10.50 of the money in the basement, where it had been carried by rats.

—*The Sun.*

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St. Louis Legislation With Reference To The Pest Control Operator

A paper presented before the National Pest Control Association War Meeting held in St. Louis on October 27, 1943, by John Buxell, Chief Engineer, Sanitation Section, St. Louis Health Division.

EXPRESSION of appreciation for invitation and privilege of speaking.

When I was invited to talk to this group, I was told that you would be interested in learning how public officials view the subject of pest control, what are some of the problems of city government which relate to pest control and how the pest control operator can cooperate with government in this field of activity.

I cannot presume to represent the official attitude nor can I hope to outline the subject completely. I perhaps can give you my own opinions and experience as one of the many officials, local, state and federal.

The public health official must look at all activities with an eye for seeing the effect of those activities on the preservation and promotion of the health of the persons within the jurisdiction of the governmental unit of which he is a part. He must keep his viewpoint sufficiently broad to include the effects on other aspects of the public welfare, so that his solicitude for public health does not cloud his vision and make his ideas and actions impracticable or narrow.

The public health official knows from his epidemiological studies—the tracing and determination of the cause of ill health—that pests—rats, flies, mosquitoes, lice, fleas, bedbugs, ticks, roaches and other insects may act as the reservoir for disease organisms, may transmit by bite or sting, or by mechanical transfer, these germs or agents which cause diseases. He knows too that the unesthetic nature of most pests, the natural aversion of people to unclean things, and the nuisance of stings of mosquitoes and other insects, of buzzing flies, of itchings caused by insects must be considered because the people often demand control measures for nuisances and look to the health agencies for relief even though the control may not be justified on a health basis alone.

Many a health official has been swept into a mosquito control campaign when there was no danger of yellow fever or malaria being transmitted by such insects, by the demand of the public for relief from the nuisance of the pestiferous mosquito.

However, public officials are also expected to conserve public funds and not spend these public moneys, and not recommend or enact laws or regulations which require spending of private moneys for the useless pursuing of uneconomical or impractical activities, even if the objective is a desirable one. Normally, health officials are given appropriations to preserve and protect public health and so each health official must examine public pest control activities, be they legal requirements or official actions, for their real contribution to the public welfare.

He soon learn that the statement that "all pests transmit all diseases, all the time, under all conditions," is fictitious and may be wrong in at least four ways.

1. Not all pests transmit disease. Some like the fly, the louse, and the rat are more dangerous than others.

2. Pests do not transmit all diseases. Some act as mechanical carriers, as the fly of typhoid fever and dysenteries, or directly as the rat for rat bite fever, or indirectly as typhus fever by the rat's fleas, or plague by rat fleas.

3. Pests do not transmit diseases at all times. If there are no disease organisms, the carrier cannot act to transmit the disease. This is true of the rats of St. Louis which cannot transfer plague organisms because St. Louis rat fleas are not infected, so far as we know, with the organisms. The mosquito is unable to infect a well person until 17-35 days after she has bitten a person ill with malaria. A time of development is necessary.

4. Pests may not be important as disease carriers because of certain conditions. In general, St. Louis' rats live in burrows in alleys and ashpits. It is relatively unusual for them to invade homes. This is not true in other countries such as China where rats live close to the people, in the same house with them. As a result a rat-borne epidemic of plague would probably spread much more rapidly in China than in St. Louis.

Thus the public health offiical may be much more concerned with pest control activities at one time than another, with one type of pest over others, and with one phase of control of a certain pest over other phases of this pest's control.

Needless to say, some pests may cause enormous economic loss through indirect or direct damage to structures and supplies and produce safety hazards of considerable moment. These aspects must be considered also.

In St. Louis, the city government through its various departments has carried on pest control activities and has enacted pest control legislation. I didn't quite realize how extensive such legislation and activities were until I started to collect them for this talk. Undoubtedly, not all have been found, however, I will list and discuss most of them, limiting them to those of the past year.

1. The regulation of the practice of fumigation. There is an ordinance of the city at present which attempts this but most of us agree that it needs extensive remodeling and modernizing. The objectives and methods of fumigation have changed and are changing rapidly. This meeting has impressed me even more on that score. The subject of governmental regulation of fumigators is complex and we want a practicable, fair and comprehensive regulation. Your meeting here will assist us to that end, I believe and we can look forward to securing a satisfactory ordinance.

1. Promotion of pest control.
    1. Hotels, boarding houses, rooming houses, and lodging houses,
    2. Frozen Dessert plants,
    3. Eating and drinking establishments.
3. Rat Control—program.
4. Mosquito Control—program.
5. Insecticides—blue sodium fluoride.
6. Termite and rat proofing through building code.
7. Post-war activities.

Pest control is normally an important consideration in community sanitation. Because of the increased hazards of disease transmission due to emergency conditions and migrations of war time, certain aspects of pet control deserve special consideration. Pestilence rides with war as one of the four horsemen. We must be on guard and prepared against the disasters which may accompany or arise out of war conditions, at least as far as this is practicable and as such disasters are probable or predictable.

ENTOMOLOGICAL FOLKLORE

By LEONARD H. HASEMAN*

Ed. Note—Given before the NPCA War Emergency Meeting, Hotel Statler, St. Louis, Mo., October 25, 1943.

IT is a pleasure to meet with you on this opening day of the eleventh annual meeting of this Association, which, in a manner similar to the medical and the nursing professions, is rendering signal service to humanity. You men are confronted today with unusual opportunities and responsibilities for service to mankind. You are making rapid progress, and yet there is still much soil to be turned. As yet, many even large centers of population still scarcely know of you and your service. Keep up the good work and, at the same time, remember that the demand of the immediate future is going to be service and more of it to everyone in need—regardless of wealth or station.

But I have been asked to speak to you for a few minutes on the subject of Entomological Folklore. As I review the ancient writings on this subject, I am struck with the general similarity between the purposes of your meeting here this week and those ancient ecclesiastical meetings or courts which were aimed at excommunicating or eliminating outbreaks of insect pests by decrees. In those days the insect pest was given defense counsel, but here in your case you have made no such provision.

Gentlemen:

This is a free country, and we are fighting this blooming war to keep it free. In wartimes we may not always do exactly as we please, but we do have a right to be heard. If we are called before the bar of justice we can appear in court and speak in our defense and call defense witnesses and counsel. Also, if the jury is stacked we have the right to challenge it. (Quote) "Inasmuch as ye have done it to one of the least of them ye have done it unto me," so says the Good Book. To me, this sounds like a defense of the "least of them" and, while I am paid as an entomologist to squelch the most pestiferous ones, I feel it my duty here today to stand up in their defense. It is un-American to condemn and persecute these defenseless little creatures without a hearing. My clients are on trial here this week in the great city of St. Louis, the hub of justice, and what have you, and you, and you, done to really give them their day in court? I'll tell you what you have done. First of all, your cordial president, your efficient secretary, and your eloquent editor have smeared and besmirched the good names of my clients in the yellow Service Sheet and in the red-edged "Pests" Journal from the Atlantic to the Pacific. No judge, or jury, after reading what you have said about them, could possibly be impartial. In the second case, Mr. Prosecutors, you have called in such expert technical witnesses as Rohwer, McDaniel, Campbell, Davis, Cotton, Smith, Snyder, Gould and others, to say nothing of this audience of practical expert operators gathered from the four corners, who for years have hounded, condemned, and persecuted my clients, their wives, and orphans. And, Your Honor, they too have their orphans. On the contrary, every effort has been made to exclude these defendants from this court of injustice, but by the help of the Almighty I am determined that they shall have

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the opportunity to at least appear in court, and I wish to call a single defense witness.

And now, Your Honor, the defense opens its case by first calling the roll of the accused. Sneaky Roach (Here**). Stinky Bedbug (Here**). Woody Termite (Here**). Fuzzy Clothes Moth (present**). Frisky Ant (Here**). Sparky Firebat (Here**). Ratty Rat. Very well, he is probably out in the alley eating his dinner. No, here he is.**

Now, Your Honor, I wish to call our one witness. Mr. Proprietor of said Hotel Statler, do you swear to tell the truth, the whole truth, and nothing but the truth, so help me God? (I do.) Mr. Proprietor, these seven defendants are at the bar of justice and, as their defense counsel, I wish to ask you a question or two, which you will answer Yes or No. Are you ready for the question? (I am.) Have you ever known either of these defendants to do any harm whatsoever, and do you ever expect them to do any harm in this or any other Hotel Statler? (No.) It is well! Your Honor, these defendants are therefore apparently harmless and not guilty of the various crimes and misdemeanors of which they will be accured in these meetings here this week. But, as further evidence in their defense, we shall, by delving into antiquity, attempt to prove that, in reality, they have been definite benefactors all down through the ages. Here, if you please, we will open up with a bit of folklore, which should stand the acid test as legal defense evidence.

First, let us consider your case, Mr. Cockroach. Sloan tells us that Indians of Jamaica use your ashes as a physic. I am sure it will work even without trying it. Also, your crushed bodies are mixed with sugar and applied to sores and cancers, and also used for earache, and you are even fed to children to kill worms. Truly, you have been and are benefactors. But, if you should ever prove troublesome all that is necessary to get rid of you is to write a polite letter, using correct spelling and punctuation, saying, "Oh, Roaches, you have troubled me long enough, go now and trouble my neighbors." Are there any reporters present? If so, this last statement is off the records, as I do not wish to divulge any of the professional secrets.

Now, let us consider your case, Mr. Bedbug. Are you a real benefactor? Well, some records would so indicate in spite of what some housewives claim to the contrary. Originally you were called the chinche, or wall-louse. We find where, in ancient times, one wise or unwise man far from disliking you took you under his protecting care and would not let you be disturbed, with the result, however, that after his death millions of you were found in his bed. Again, we note that the Banian Hospital at Surat was a haven for all kinds of animals, even you included, and the overseer often hired beggars from the street for a stipulated sum to pass a night among you and your associates, the cooties and fleas, on the expressed condition of suffering you to enjoy your feast without molestation. Again, Pliny reported that you would neutralize snake venom taken internally or applied with the blood of tortoise directly to the wound. Some also crushed you with salt and woman's milk and anointed the eyes, and in combination with honey and oil of rose you too were used for earache. Taken internally, seven of you for a grown-up and four for a child, was an ancient cure for vomiting, malarial fever, and hysterical suffocation. Two of you attached to the left arm with some wool stolen from a shepherd was used as a cure for nocturnal fever, and for day fever you were enclosed in a piece of russett-colored cloth. As recently as 1865, some Ohio countryfolk ate you as a cure for fever and ague. But should you ever annoy anyone, note that by filling a vessel of cold water and placing it under the bed you will never again touch the sleeper. This last statement is also off the records as a professional secret.

And now, Mr. Termite, of what real benefit have you been to humanity down through the millions of years that you have passed unchanged in form and habits? Well, for one thing, we find that in Brazil natives hollow out and use your nests as ovens. Also, the clay from your hills is used for the floors and walls of South American huts as it becomes hard as stone. Also, it is said that fleas will not breed on such floors. In Central Africa, natives chew the clay of your hills when their tobacco fails, and they call it "sweet earth." Down through the ages you have served as food for natives of Africa and India, and have saved the lives of millions in famine years. Livingston, in Africa, sampled you.

Unfortunately, the books record little to your credit, Mr. Clothes Moth, though after all you only eat holes. I do note however that in Germany, in 1865, your forbearers were directed by one Herr. Hobenstreet of Munich to spin on a paper form a complete garment without seams and of the finest silk to be worn over her court dress by the Queen of Bavaria. In 1930, others should have spun a bit of crepe for a certain house painter. Again, Pliny, back in the dim ages, came forward with a professional secret for protecting clothes, should you worthy creatures ever fall from grace. His remedy was to put a coffin in the closet and lay the clothes on it. However, a simpler remedy is to hide the skin of a kingfish in the closet.

Mr. Ant, your exemplary character and example of industry and judgment should stand you well in hand during this week of trial. The records credit you with bringing up from the bowels of the sandy deserts much of the fabulous hordes of gold in India. However, according to the records, your progenitors were the size of a wolf and they were probably desert wildcats. The Arabs placed one of you in the hand of a newly born infant, repeating the words, "May the boy turn out clever and skillful." You were used in divinations by the Greeks and generally foretold good. To dream about you, according to the Royal Dream Book, meant that one would live in a big city or in a large family, or that one would be industrious, happy, and well married and have a large family. Never kill an ant, for it is a fairy and will bewitch your cows, so they say in Virginia. In the "Ants of India" we learn that when your red cousins inhabit a house the owner will be prosperous. In Sweden, you are distilled with rye to give a better flavor to the inferior kinds of brandy. Again, according to ancient Pliny, if the finger nail parings are thrown on an ant hill and the first ant to take hold of one of the parings is attached to the neck of a sick person he will promptly be cured.

I am sorry, but Mr. Firebrat you are in a hot spot, but you can take it since you usually play around on hot boilers. I have not been able to find in the books any real good you have done in the past, unless it was when you twiddled your thumb at Nero while Rome burned.

As for you, Mr. Rat, all I can find that might be classed as either a good or bad turn was when you helped the cityslickers to skin the Pied Piper out of his fee. And by the way, if any of you really want a slick cure for rats you better read the story about the Piper.

Well, Your Honor, we have proven that the defendants are benefactor and not pests so the defense rests its case, and may the judge have a heart and, at least, a few drops of the milk of human kindness when he passes sentence on my seven clients.

*Head, Dept. of Entomology, Univ. of Missouri, and the Missouri Agricultural Experiment Station, Columbia, Mo.

**Dr. Haseman displayed actual specimen of particular insect or rodent mentioned.

Who Is This Young Fellow—Wide Awake, Alert, Observing?

He is Ted, son of our National P. C. Association Secretary, Bill Buettner. We wonder if his dad was as wide awake when he was at that age. Bill must be lecturing or giving one of his P. C. subjects for he is certainly paying very close attention.

The joke of it all is that Bill doesn't know anything about the picture being sent. Jr. mailed it to our office. Thanks Jr., we appreciate this very much.

Notice

We are glad to print personal items of interest. Send us interesting or newsy items about yourself or your family. This magazine is for the pest control industry, and news about YOU is interesting to the rest of us.

Tests With a Pyrethrum Aerosol Against Cockroaches and Stored Product Pests *

By H. A. U. MONRO
Plant Protection Division, Montreal, P. Q.

Reprinted from the 73rd Annual Report of the Entomological Society of Antario, 1942, Page 61-63.

THE use of insecticides in the form of aerosols has recently received considerable attention (1, 2, 3). The employment of a liquified gas as a means of dispersion has been described by Goodhue and Sullivan (4). So far, it would appear, this technique has been used mostly against flies and mosquitoes in the free space of enclosures, such as tents or the cabins of aeroplanes.

The present series of tests was carried out with a proprietary pyrethrum aerosol consisting of 1 per cent pyrethrins, 2 per cent oil of sesame and 97 per cent inert gas, dichlorodifluoromethane, contained in a steel cylinder capable of holding five pounds of the mixture and equipped with a nozzle designed for small oil burners. The cylinder was fitted with a siphon tube and discharged two ounces of aerosol per minute.

Indian Meal Moth, Plodia interpunctella Hbn., in Elevator Bins.—In tests against the Indian meal moth infesting wheat in elevator bins filled almost to the top, leaving only 500 to 1000 cubic feet of air space above the surface of the grain, it was found that complete mortality was secured of all adult moths, flying or fully exposed in the free air, with all four doses tested at 2, 4, 8 and 12 ounces per thousand cubic feet. Recently emerged adults, covered with web on the walls of the bins, were only partially controlled, while even at the highest dosage, larvae collected from the webbing on the walls or from the characteristic bundles near the surface of the grain yielded only 7 per cent control. However in this case only, a number of dead larvae were found suspended from the walls and ceiling, thus demonstrating that freely exposed larvae, crawling in the bin, had succumbed to this higher concentration.

This aerosol, therefore, could be employed at a comparatively low concentration at regular intervals to control adult moths flying in storages, and thus prevent their spread to other products in the building. It could not be used to gain control of different stages of the insect when penetration of web, grain or other material is necessitated.

Tests in Steel Vault.—In experiments carried out at 65 degrees F. in an empty airtight steel vault of 1200 cubic feet capacity, 4 ounces of this aerosol per thousand cubic feet was tested against adults of the red flour beetle, **Tribolium castaneum** Hbst. and mature larvae of the dark mealworm, **Tenebrio obscurus** F. The mealworms were placed in glass jars and were unprotected while the beetles were left fully exposed in dishes, or placed in salve tins of two-inch diameter pierced at the top with a hole of three-quarter inch diameter filled with (a) 32 to the inch copper mesh or (b) 80 to the inch

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100 lb. Drum.....38c per lb.
50 lb. Drum.....40c per lb.

Bosley's Roach Powder Containing
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steel mesh. The insects were placed near the roof or on the floor and the aerosol discharged through a small hole six feet from the floor and one foot from the roof of the vault. In three types of experiment the following results were obtained, after exposure periods of six hours.

(1) **No fan circulation:** Complete control was secured of the fully exposed insects at the bottom of the vault, but no significant mortality was obtained with those near the top or with any of the **Tribolium** adults protected by the mesh.

(2) **Fan circulation:** A fan displacing 625 cubic feet of air per minute was suspended in the vault, and ran continuously during the test. Complete mortality was observed with all fully exposed insects at the top and bottom of the vault, no significant kill was obtained with the protected Tribolium adults at the top, but 59 per cent and 100 per cent kills respectively were observed in the 32 and 80 mesh tins on the floor of the chamber.

(3) **Discharge into a partial vacuum:** An initial vacuum of twenty inches (ten inches of absolute mercurial pressure) was drawn on the vault and the hole in the side opened. The aerosol was discharged into the vault in the stream of air entering the chamber until ordinary atmospheric pressure had been obtained. This method was tried to determine if the air being carried into the tins by the dissipation of the vacuum would convey the aerosol in a toxic concentration. This did not appear to be the case, as the mortalities obtained were very similar to those observed with the fan circulation.

From these results it would appear that this aerosol, at a commercial dosage, would not be suitable to control pests in the holds of steam ships and in railroad cars where any degree of penetration into cracks and crevices would be required.

Tests Against the German Cockroach Blattella germanica L.—In a field test one pound of the aerosol was discharged in a wash room of four thousand cubic feet capacity. This room carried a heavy population of roaches, concealed in the wooden walls which were pierced at intervals with one inch holes to allow diffusion of other types of spray usually employed. As soon as the aerosol was discharged, the cockroaches exhibited the characteristic reaction of running out into the open. After two hours, from a large number of moribund roaches lying on the floor, a representative sample was collected, all of which died within two days. As the concentration of the aerosol built up inside the room, some roaches ran out into the hall outside and 80 per cent of these succumbed.

After two days the room was treated again with two quarts of a fine kerosene spray containing .224 per cent pyrethrins and 2.5 per cent normal butyl carbitol thiocyanate discharged with compressed air at ninety pounds per square inch. This spray had previously been used in the same room and yielded many dead roaches, but on this occasion only a few emerged, demonstrating the effectiveness of the previous aerosol treatment. This spray produced a heavy deposit of kerosene on the floor, and all the roaches inside the room were killed. An interesting comparison was afforded by the fact that the roaches which ran into the hall on this occasion all survived.

The cost of the aerosol and spray treatments would be approximately the same, bearing in mind the extra amount of labor required to assemble and handle the spray as against the higher material cost in the case of the aerosol. In the case of the spray, also, the provision of the compressed air or other dispersing agent must be considered, as well as the inconvenience temporarily caused by the heavy mist and deposit of kerosene.

It is thought that the aerosol could be applied against cockroaches under special conditions, such as places where powders could not be safely or conveniently employed or when control of other insects, such as flies, is desired at the same time. The portability of the aerosol commends it for use in isolated situations.

Acknowledgments: The co-operation of Dr. R. G. Law, Chief Sanitary Officer, Canadian National Railways, in carrying out the cockroach test is gratefully acknowledged. The experiments were carried out with the assistance of Mr. R. Delisle and Miss A. Gaudet of the staff of the Fumigation and Inspection Station, Montreal.

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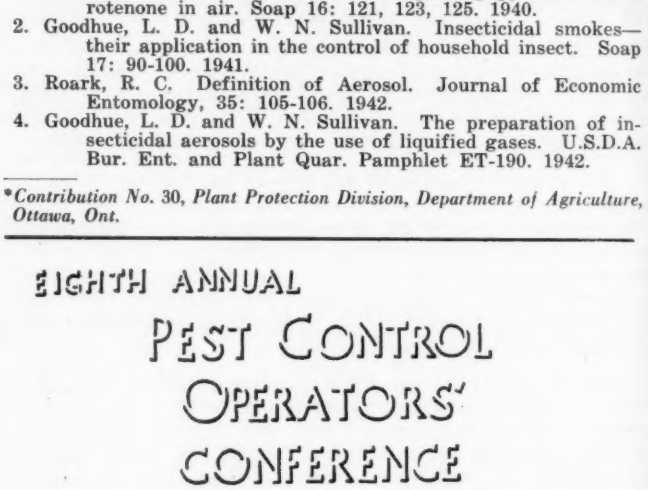
*Contribution No. 30, *Plant Protection Division, Department of Agriculture, Ottawa, Ont.*

EIGHTH ANNUAL

PEST CONTROL OPERATORS' CONFERENCE



" LET'S PUT SOMETHING ON THE BALL AND MAKE A STRIKE ON EVERY CALL"

PURDUE UNIVERSITY
Lafayette Indiana
January 17-20 1944

Formulation of Rat Baits

By JUSTUS C. WARD,* *Wildlife Research Laboratory, Denver, Colo.*

Reprinted from Soap & Sanitary Chemicals.

WARTIME SHORTAGES of many of the common poisons used in rat baits, together with rationing of many food ingredients, have posed serious problems for the specialist in rodent control. It has become more and more difficult to prepare ideal baits under these conditions and some concessions have had to be made. Let us review briefly the salient points which must be considered in setting out to blend the ideal rat bait formula.

First of all, a rat bait must be palatable, since the animals have to be induced to eat it in preference to other foods which may be present in abundance.

In the next place, the bait must contain enough of the toxic agent to destroy rats eating relatively small amounts.

Then, it should remain attractive long enough for suspicious animals to overcome their timidity and feed on it.

Also, it should contain enough odor to draw rats to the less attractively placed bait spots.

When these specifications are examined it would seem that a bait meeting all of them might be an ideal one, if we could add the characteristics of a specific poison—one which would kill nothing but the animals to be controlled. It has become increasingly difficult, however, to prepare such ideal baits under present restrictions which are severely handicapping our wartime programs of rat control.

The poison situation in the United States is now reported to be improving slowly. It appears that supplies of strychnine, arsenic, zinc phosphide, barium carbonate and phosphorus preparations are assured. Limited red squill shipments from North Africa have reached this country, and it seems probable that the fortified powder will be available eventually for the general trade. On the other hand there is little hope that any large amount of thallium will be available for civilian use until foreign imports are reestablished. Some of the less well-known chemical poisons are on the market in quantities suitable for limited trial, among which are zinc cyanide, barium arsenate, glycerol-monochlorohydrin and. phenyl thiocarbamide. The main reason that some of these substances are not used more extensively is that they are not accepted well in any bait combination with which we are familiar. Recent research findings have indicated that several newer chemicals in the synthetic organic field may be extremely useful for rat control.

In addition to acknowledging the fact that many rodent poisons may be available, it is a matter of satisfaction to be able to report that intensive researches are now underway to find and test new substances which may be more effective, or cheaper, than those now in use. This project has been made a major one in the Wildlife Research Laboratory for the duration of the war.

Accordingly, it would seem that our wartime rat bait problem is associated as much with lack or shorage of food items as with restricted lethal agents. It is repeti-

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tion to state that rats vary so much in food preferences that any list of baits in order of average acceptance will mean very little to the pest control man who has a specific problem and needs a particular bait to help him solve it. In general, however, rats will eat all of the three major food types—proteins, fats and carbohydrates, and an endless variety of baits may be prepared from mixtures of these elements. Wartime rationing has reduced the availability of such attractive foods as ground beef, canned fish, fresh fat, vegetable oils, various preserved vegetables and fruits, and in short most of the better rat bait ingredients. Even though this picture has been modified somewhat by industrial rationing of limited supplies of certain items for use in rat bait, it is still quite desirable to develop formulas which do not use rationed foods. This laboratory has been making studies along that line, so for a moment let us consider some specific bait formulas of that type.

In the first place, ground horse meat has proved to be an acceptable substitute for beef hamburger, and for operators who live near areas where fur farms are common, this product can be obtained quite readily. Its general distribution for use in pet foods is increasing, and it should be possible soon to find horse meat in any of the larger cities at stores serving that trade. It is used successfully as the horse "hamburger" mixed with 10 per cent fortified red squill powder, 2-3 per cent white arsenic, 1½ thallium, 1 per cent zinc phosphide, and ½-1 per cent of some of the newer research poisons. Such baits are highly perishable, however, and must be mixed quite shortly before being placed. A modification of this 100 per cent meat type bait is one which contains from 50-75 per cent ground meat and 50-25 per cent of a cereal such as bread crumbs, cracker crumbs, corn meal, or oat meal used to absorb some of the moisture in the meat. Such a combination will remain good much longer, which will permit bait manufacture several hours ahead of the time it is to be used. These formulas seem to be accepted practically as well by the rats as straight meat.

Where animal proteins, such as fresh meat, are entirely unobtainable, there are certain vegetable proteins worthy of trial. One of these is the material called "soybean lecithin," which is available in a wide variety of forms, varying in purity from a crude "tank settling," taken from the bottoms of soybean oil processing stills, to a refined substance suitable for use in candy and other human foods. Curiously enough rats prefer tank settlings as long as they are not rancid. A typical formula using this material is prepared by warming one-half pound of tank settlings with one-half pound of mineral oil until a smooth solution has been formed. One pound of fortified red squill powder is then mixed with the oil and added to eight pounds of bread or cracker crumbs. Peanut butter is another plant product high in protein, with which most rat poison manufacturers and users are familiar, and we have used it in many of our wartime formulas with good results.

In most sections of the country, fresh fish are still on the market—at least at frequent intervals—and this protein is used to good advantage in rat baits. It must be handled in the same way as that described for horse meat, since the product is extremely perishable. One of our most satisfactory formulas is made by grinding two pounds of fresh fish (preferably halibut) and mixing that with seven pounds of poultry rolled oats or bread crumbs and one pound of fortified red squill. Since the cereal is added for the purpose of making the bait last better, its proportion may be adjusted to suit the conditions under which the bait is to be used.

(Continued on Page 27)

WHAT'S NEW IN PEST CONTROL-PERSONALS

BERT LEWIS, of the Lewis Pest Control, Muncie, Ind., recently made a trip to Florida to visit with his son, John, who is in the Army and expected to go overseas shortly.

CHARLES ROSENTHAL, former manager of Orkin Exterminating Co., Nashville, Tenn., has been promoted to first lieutenant in the Army Air Forces. He was transferred recently to the AAF Special Services Office at Muskogee Air Base, Okla.

OUR CONDOLENCES to Mr. Stanley Justice, Noxx Chemicals Co., Columbus, Ohio, who lost his father recently.

One of the feature demonstrations during the PCO Conference at Purdue was the routine inspection for bedbugs in room 429 (Ben's room) Fowler Hotel. The inspection lasted from 1:30 to 2:00 (yes A.M.). A reinspection is scheduled for January, 1945.

Ed Arnott suffered a broken arm just prior to the Purdue Conference which prevented his coming to Lafayette. We all missed you Ed, and wish for you a quick and complete recovery.

STARTING WITH THE JANUARY, 1944 issue, the two bulletins, previously known as Discoid News Bulletin and Cyanogas News, published by the Insecticide Dept. of American Cyanamid & Chemical Corp., are to be combined, effective with the next issue. A change in the design of the masthead is to be put into effect.

MAJESTIC CHEMICAL & EXTERMINATING CO., located at 143 W. 53rd Street, N. Y. for a number of years, will move to greatly enlarged quarters at 131 West 53rd Street, a few doors away, on February 15. Sidney Wimmer, a director of the NPCA, heads the concern. More power to you, Sid.

DOW OPENS TWO OFFICES

Dow Chemical Company, Midland, Mich., has opened sales offices at 20 Providence St., Boston, and 1400 S. Penn Square, Philadelphia. Alfred A. Lawrence, with Dow since 1940, has been named manager of the Boston office and Alexander Leith, Jr., with the New York office since 1923, has been named manager of the Philadelphia office.

ROTENONE: Small carryover stocks suggest a tight market for this material, according to Oil, Paint & Drug Reporter, which further states: "Importations in time for the coming season will probably be about half of earlier estimates." Although amended FPO-13 permits expanded uses, this does not mean an increase in supply. Arrivals have been mostly in low percentage root.

DDT — 2,2-bis(p-chloropheny) - 1,1,1 - trichloroethane—was placed under allocation December 10 by being added to Allocations Order M-340 (WPB-4660).

KUTZ RETURNS TO ACTIVE SERVICE WITH du PONT CO.

Appointment of Milton Kutz as acting assistant general manager of the electrochemicals department of E. I. du Pont de Nemours & Company, Milmington, effective January 1, was announced recently by Frank S. MacGregor, general manager of the department. The appointment marks the return of Mr. Kutz to the post which ill health forced him to relinquish eighteen months ago for a term of less active service.

AN INDUSTRY MEETING was scheduled in the Agriculture Building, San Francisco, Calif., January 29, 1944, for consideration of any revision of Economic Poisons Regulation No. 18 relative to products containing lead, according to a recent announcement by Dr. Alvin J. Cox, Chief, Bureau of Chemistry, Department of Agriculture, State of California. He further states this meeting is being called in accordance with request of the Executive Committee of the Pacific Insecticide Institute as expressed at a discussion of the subject in San Francisco on November 18, 1943.

LIVESTOCK INSECTS—Circular 19, Insects in Relation to National Defense series, issued by U. S. Department of Agriculture, Bureau of Entomology and Plant Quarantine. October 1943. Discusses, among other things, insects attacking horses, insects attacking dogs, a pest of pigeons. Control measures.

The "12th Annual Business Meeting" of the NPCA will be held at the Hotel Sherman, Chicago, Ill., October 23, 24 and 25 next, according to a recent announcement. Program plans are under way.

NAVAL RADIO OPERATOR Le Roy Weisburger, when in civilian life with the insurance firm of B. & D. A. Weisburger, N. &., is back in that city on leave after five months duty at sea. He reports his ship suffered a bomb hit while in the Mediterranean. Le Roy, fortunately, came through O.K. and expects to return to duty soon.

THE STORY IS BEING TOLD of a stranger challenging a bartender: "Mix any drinks you want, and I'll be able to name what went into 'em. If I name 'em correctly, then I don't pay. If I can't I'll pay double." The bartender agreed, and offered his first concoction. "This is Italian Vermouth, Scotch and blackberry brandy," said the customer. He won. The bartender tried again. "This drink has Holland Gin, Bourbon and Creme de Menthe," said the customer, and won again. The bartender tried 20 more drinks. The customer drank them, named them, and paid nothing. . . . The bartender finally offered ice and plain water. "Thish I can't name," said the woozy customer. "Thishisha new one on me. But lemme tell

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ya, mister, yull neveh make a livin' outta 'em."

—From the "Lyons Den", N. Y. Post.

HIDE BEETLE: The use of sodium silicafluoride in the preservation of hides against attack by beetles is being investigated by the South African Leather Industry Research Institute, according to the Chemical Trade Journal. The method recommended is to immerse the hide in a 0.5 p.c. solution of sodium silicofluoride for fifteen minutes and then to drain. Acetic acid should not be used with the silicofluoride, because it hinders penetration. Such treated hides can be then cured by the ordinary methods and will be immune from attack by the hide beetle.

WAR PRODUCTION BOARD announces authorization of enough carbon steel and tin plate to permit production of 2,500,000 less-than-quart size insecticide sprayers for household use in the first quarter of 1944. This is in addition to the million for the last quarter of 1943.

FURTHER STUDY OF THE PROBLEM of just where Tephrosia Virginiana (devil's shoestring) will produce worth-while rotenone content is reported by A. F. Sievers, M. S. Lowman and G. A. Russell of the Agricultural Research Administration, states the AIF News. Earlier studies showed the plant in its wild state contains "no rotenone or only traces except in a few restricted localities in southwest Georgia, in Texas, some extending into Louisiana northeast Florida and a number of areas and Oklahoma."

The new study "appears to show that in general there are certain strains of the species that have the capacity to produce rotenone under most conditions, but that certain environmental conditions not yet understood can greatly modify the capacity . . . No single locality anywhere can safely be selected for commercial planting (of Tephrosia Virginiana) without a previous trial planting, unless such locality is in a general region where wild plants of reasonable value may be found."

$200,000,000 RAT DAMAGE

Rats caused $200,000,000 damage to city and farm property in 1943, the Fish and Wild Life Service discloses. The service said the excessive loss, far above 1942 estimates, was due to high values of the farm and food products which were destroyed.

—N. Y. Herald Tribune.

Business Opportunities

(Classified)

RATES — For individuals seeking employment, 5c per word, minimum $1.00. All others 10c per word, minimum, $2.00. All advertisements must be in the hands of the publishers seven days before publication date and must be accompanied by cash or money order for payment in full. The publishers are not responsible for any false or misleading advertisements.

Replies to advertisements where box number only is indicated should be addressed c/o PESTS, 512 E. 14th St., Kansas City 6, Mo., giving box number as well.

Aggressive, reputable firm, needs 2 experienced Salesmen for New York City and Conn. Opportunity Branch Manager. Write full qualifications, past experience and salary desired. Box 555—Pests.

LOCAL ORGANIZATION NEWS

Program Household Pests Identification Course for Pest Control Operators

College of Agriculture, Rutgers University, New Brunswick, N. J. Professor Frank G. Helyar, Director of Resident Instructions Feb. 7, 8, 9, 1944*

Sponsored by Rutgers University in Cooperation with the N. J. Pest Control Association, Inc.

The study of entomology is an integral part of pest control. Identification, an integral part of the study of entomology, is, therefore, an essential element in surveying and making analyses of any pest control services to be performed.

Though local meetings, regional conferences and conventions provide invaluable information, it is difficult to allow, at such meetings, three successive days for entomological studies and laboratory work. To help meet this need, there has been made available, through the sponsorship of Rutgers University and the cooperation of the N. J. Pest Control Association, Inc., a splendid three-day course in insect identification.

Attendance details and program follow.

PLACE: All sessions held in the Entomology Building, Georges Road and Jones Ave.

TIME: Daily sessions from 9:30 A. M. to 12:30 P. M.—2:00 P. M. to 5:00 P. M. There will be no night sessions, so as to allow students to commute, if they so choose.

FEE: $7.50, payable with letter requesting registration. Make checks out to the Secretary, J. Edwin Sameth.

REGISTRATION: Write the Secretary of the New Jersey Pest Control Association on your own letterhead, enclose check for $7.50. The first 24 registrations received will comprise the full enrollment for this session. *If the demand is sufficient, the course will be repeated on February 21st, 22nd, and 23rd. You do not have to be a member of any association to attend.

HOTEL ACCOMMODATIONS: At the Roger Smith Hotel, New Brunswick—attention: Mr. Edward Roberts. Write to him directly. Mention "Pest Control Short Course, Rutgers." Rates—$4.00 to $6.00 for double room.

EQUIPMENT: Ordinary hand lens; if you have Metcalf and Flint's "Destructive and Useful Insects," bring it. (Note: University will furnish a notebook and outline, the use of a microscope for every student, and everyone will take back a box of mounted specimens for comparison purposes.

FEBRUARY 7th

Morning:
Lecture: Arthropods (the jointed-leg animals).
Laboratory: Recognition of true insects, spiders and centipedes.

Afternoon:
Lecture:
a. Gradual and complete metamorphosis in insects.
b. Basic taxonomic arrangement of insects.
c. Fundamental insect structure.
Laboratory: Insect structure: the cockroach.

FEBRUARY 8th

Morning:
Lecture: Insects with gradual metamorphosis.
a. Those that destroy food, such as cockroaches, crickets, etc.
b. Those that attack man, such as bedbugs, etc.
Laboratory: Recognition of species.

Afternoon:
Lecture: Insects with complete metamorphosis.
a. Coleoptera that destroy food, such as grain beetles, etc.
b. Lepidoptera that destroy food, such as flour moths, etc.
Laboratory: Recognition of species.

FEBRUARY 9th

Morning:
Lecture: Insects with complete metamorphosis.
a. Coleoptera that destroy fabrics, such as carpet beetles, etc.
b. Lepidoptera that destroy fabrics, such as clothes moths, etc.
Laboratory: Recognition of species.

Afternoon:
Lecture: Arthropods attacking man.
a. Siphonaptera (fleas).
b. Acarina (mites, ticks).
Laboratory: Recognition of species.

Milwaukee Pest Control Association

A special meeting of the pest control industry of Wisconsin, sponsored by the forward-looking Milwaukee Pest Control Association, was held at the Plankinton Hotel, Milwaukee, on January 22, 1944. Attracting a state-wide and out-of-state attendance of 87 PCOs and their guests, the meeting was devoted, primarily, to talks of war and post-war concern. NPCA officials, university and state entomologists, local and state health officials, as well as representatives from the U. S. Department of Interior and the Milwaukee Building Owners and Managers Association, were among the featured speakers. Interspersed were showings of unusual and instructive motion pictures. Harry J. Hammond, president of the Milwaukee Pest Control Association, presided.

Of great help in clarifying many of the Industry's current perplexities was a talk by Secretary William O. Buettner on "Critical Materials, Manpower Rationing, Legislation", and one by President George Elliott on the "Outlook of Industry for 1944", followed by round-the-room questions-and-answers. The foregoing events occupied the morning sesion, which, incidentally, was closed to all except owner-operators.

Mr. Buettner's talk on the "Purpose, Objective, and Responsibilities of the Pest Control Industry", after the luncheon interlude in the Lotus Room, initiated the "open" afternoon session of the one-day meeting. Mr. Elliott followed with comments of general interest.

Informative and helpful, particularly in view of material shortages, was a discussion on "Newer Insecticides That Could Be Used in Pest Control Work" by Dr. C. L. Fluke, Professor of Entomology, University of Wisconsin, Madison, Wis. Sabidilla, Dr. Fluke indicated, was worthy of greater exploration.

In his constructive talk, "Sanitation and Hotel Restaurant Inspections", which fol-

(Continued on Page 30)

Some Aspects of Moisture In Its Relation to Insect Pest Control

By A. E. MICHELBACHER, *University of California*

LIKE ALL OTHER organisms insects are dependent upon water for their development. Because of their very efficient use of water, many species are able to live in environments where there is a very limited supply of moisture. There are many insects which live in cured lumber, and numerous others that complete their development in dried grains, cereal products, dried seeds, nuts, dried fruit, dried animal products, and various dried vegetable materials other than those mentioned. Contrasted with these, there are those insects which, in the immature stages at least, actually live in water. Some of the important members of this group are: mosquitoes, dragonflies, damselflies, mayflies, stoneflies, certain beetles, water bugs, and numerous other insects. Between these two groups there is a range in the moisture requirements, and we find some insects that are dependent upon succulent vegetation for their development while others can subsist on dryer materials. The moisture requirements may vary considerably for the different stages of development for the same insect. For instance, mosquito larvae must live in water, while the adults are air living insects, and are far less dependent upon water than are the immature stages. Apparently the winged migratory forms of aphids are less dependent upon a constant supply of moisture than are the wingless feeding forms. The latter die in a relatively short period if removed from their host, while the winged migratory forms live for considerable periods away from their hosts. The latter forms must be equipped with a mechanism that not only efficiently uses moisture, but also conserves it. This must be the case for large swarms of pea aphids were once observed on the desert many miles from plants that would have served as hosts. Certainly the hot desert sun would soon have dried out and killed these aphids if they had no efficient mechanism for the conservation of moisture.

The ability of insects to efficiently utilize or conserve moisture is largely linked with physiological processes. In addition some insects have special morphological features that serve to help conserve moisture. The nocturnal habits of many desert insects were probably developed as means of not only escaping intense heat, but also for the conservation of moisture. The aestivating habits of insects is probably associated with moisture as well as temperature.

Many insects can be controlled by regulating the amount of moisture in the environment. Drainage is widely used in controlling mosquitoes, and floating logs in water are an effective means of controlling certain forest insects. Not only are the logs made unattractive to the insects, but the immature forms are killed if the logs are already infested. Insects, such as powder post beetles, can only live in dry cured wood, and are killed if the wood is moistened. Contrasted to these are the **Ambrosia** beetles which can develop only in moist wood and are killed if it is dried.

Although a large number of insects are highly adapted to live in dry materials, dryness can be utilized

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in controlling or checking damage caused by most of the economically important insects belonging in this group. In general, dryness tends to prolong development, and usually after a certain degree of dryness is reached the insects are killed. There are records where wood borers having a normal life cycle of 1 or 2 years have required as many as 20 or more years to complete their development under unusually dry conditions.

In the case of the subterranean termites, control would be a very difficult undertaking if dryness and ventilation were not taken into consideration.

It is probably safe to conclude that most species of insects are rather readily killed by "drying out" the environment in which they live. With many the process need not go far. Certainly not much drying is necessary to kill most of those insects which feed on succulent vegetation. As their hosts start to wilt and dry, conditions become extremely unfavorable for their development and survival. The same holds true for many soil inhabiting insects as the soil dries.

In the protection of stored products from insect damage dryness is essential. The materials as well as the storage units must be dry. The value of a low moisture content plus dry and clean storage can not be overemphasized, and is the best insurance against serious insect infestation.

Insects that attack stored fodstuffs are widely distributed, and usually products become infested and serious damage occurs in a relatively short time if the moisture content of the food is high or if foods with low moisture contents are stored in damp or leaky storage units.

This is well illustrated in surveys of bulk farm grain storage units in California which were made during 1942 and 1943. Most of the wheat and barley was harvested with a moisture content of 10 per cent or less and much of it had a moisture content as low as six or seven percent. With so low a moisture content there should have been little danger of serious insect infestation if the grain was placed in clean dry storage. This was particularly true since the moisture content of much of the grain was so low that stored grain insects found an environment unsuited for their rapid development. However, some grain goes into storage with a relatively high moisture content. This is likely to occur along the foggy coastal areas, or where grain is harvested early ahead of flood waters, or where a very weedy condition prevails. When dry grain was placed in clean dry storage it was not uncommon to find it free of insects and in excellent condition at the end of a year in storage. Dry grain placed in bins where moisture had penetrated through the bottom, was in poor condition and often heavily infested in this zone, but the rest of the grain above was usually in excellent condition, although some insects usually had migrated from the heavily infested grain on the bottom of the bin to the drier grain above. These insects frequently set up insipient infestations in the sound dry grain. Where the roofs or seams of bins had leaked pockets of "grain out of condition" were often encountered and infestations that threatened the entire mass of grain were usually getting under way. Where moist grain had been placed in dry bins, it was not infrequent to find serious infestations developing throughout the mass of grain. The most outstanding observation in all the surveys was that where conditions were dry there were usually few or no insects, while where "wet" conditions prevailed, whether due to moist grain or moist storage, heavy and threatening populations were the usual thing. Where serious and destructive populations occurred under poor storage conditions, handling the situa-

tion presented a difficult problem. Stored grain pests could be found nearly everywhere both inside and out of the storage unit or units. In most cases such an infestation could have been avoided if the grain had been placed in clean dry storage.

The value of dryness in limiting insects could be illustrated by many examples. Home owners frequently bring in cereal and similar mites and complain that they can do nothing to get rid of them. Yet under the dry conditions of our laboratories these same mites find conditions unfavorable for their existence except in the cultures in which they are being reared. Dryness must be the limiting factor that inhibits their spread. Psocids are likely to develop in enormous numbers under moist conditions but soon disappear when the environment is dried out and ventilated.

Although increasing the moisture content can be utilized in certain cases in controlling insects, drying out of the environment has a much wider application in the control of most household and stored product insects that cause losses to man. In most cases the person who is interested in pest control should see to it that proper moisture condition are maintained at all times. In the second place emphasis should be placed on proper sanitation. Certainly if these two factors are given prime consideration the job of keeping pests in check will be greatly facilitated.

Court Decisions on Public Health

Typhus fever—contraction by bakery employee—liability of employer.—(Georgia Court of Appeals, Division No. 1; **Blair v. Fulton Bakery, Inc.**, 24 S. E. 2d 598; decided March 6, 1943.) An action was brought against a bakery to recover damages for the alleged negligence of the defendant in failing to furnish the plaintiff with a safe and healthy place in which to work. The plaintiff, after working for about 9 months for the defendant as a baker, contracted typhus fever. Among other things, the plaintiff alleged that after becoming ill he learned that the defendant had contracted with people in the business of exterminating rats to spread rat poison to kill rats that lived and bred in the bakery and that the defendant negligently allowed the rats so killed to remain under some old and unused machniery and pieces of metal. As the proximate result of the defendant's so doing, the plaintiff alleged that he was bitten by fleas from such dead rats and contracted typhus fever. Another averment was that when a rat dies the fleas "then leave" the body of the rat and "seek out a live being on which to live and secure nourishment from said being's blood stream." The defendant demurred to the petition, thus admitting all facts well pleaded but challenging that they were legally sufficient to constitute a cause of action. The lower court found in the defendant's favor and its judgment was affirmed by the Court of Appeals of Georgia.

Following are some of the views expressed by the appellate court: An employer is not an insurer of the safety of his employees and is bound only to the exercise of reasonable care; it is as much a master's duty to use reasonable care to protect his servants against dangers of the employment which may reasonably be expected to produce disease as it is to use reasonable care to protect against dangers which may produce physical injuries; a master is bound to exercise ordinary care in furnishing the servant a safe place in which to work, but the latter must exercise like care in discovering any defects therein; a master is not liable unless by the exercise of ordinary care and diligence he could have reasonably apprehended that his negligence would or might result in injury to some one of his servants; and an employer is not bound to foresee and give warning of remote, improbable, and exceptional occurrences, his duty being limited to such perils as reasonably are to be anticipated.

The court of appeals said that "to require of the defendant the duty of finding each dead rat and removing its body from the bakery before the fleas could leave the bodies, would be very much like demanding that the defendant do an impossible thing." According to the court there was nothing in the petition which constituted a sufficient allegation that the defendant knew or by the exercise of ordinary care should have known that any of its employees would contract typhus fever by reason of the rats being killed and left in the bakery.

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MADISON AT WILLETT MEMPHIS 4, TENNESSEE

Children bitten by rats—action against owners of adjoining premises.—(California District Court of Appeal, First District, Division 2; **Coole et al. v. Haskins et al.**, 135 P. 2d 176; decided March 23, 1943.) The plaintiffs were children of 2 and 3 years of age, respectively. They brought an action to recover damages for personal injuries alleged to have been sustained when bitten by rats. The complaint alleged that they were bitten while sleeping in a portion of the premises owned by the defendants and rented to the parents of plaintiffs as a residence. The defendants operated a restaurant on an adjoining portion of the premises owned by them. Negligence and the maintenance of a nuisance were charged by the plaintiffs. It was alleged that discarded food and vegetable matter, refuse, and debris were allowed to accumulate about said premises and restaurant so that rats were attracted to and infested the same, thereby causing the premises to become unfit for human habitation, and also that such condition was allowed to continue despite requests to remedy it. In support of their action the plaintiffs relied in part upon section 1803 of the California Health and Safety Code, which required every person possessing any place infested with rodents, as soon as he knew of their presence, to proceed at once and continue in good faith to endeavor to exterminate them. One allegation of the complaint was that the above-mentioned condition commenced in June 1941 and was known to defendants at all times and that the plaintiffs were bitten in October 1941.

The trial court sustained the defendants' demurrer and dismissed the complaint, but the California District Court of Appeal took the view that the allegations of the complaint were sufficient to state causes of action based upon negligence and upon the maintenance of a nuisance. While, said the court, the complaint is based upon an unusual set of facts and no authority directly in point has been called to our attention, "this is no valid objection provided the facts alleged bring the causes within recognized general principles of law." A prior case was quoted from to the effect that no person is permitted by law to use his property in such a manner that damage to his neighbor is a foreseeable result.

With respect to the defendants' contention that their duties toward plaintiffs began and ended with their duties as lessors of the portion of the premises in which plaintiffs resided and that the complaint failed to show a violation of defendants' duties as such lessors, the court stated that, as it viewed the complaint, the gist of plaintiffs' causes of action was an alleged violation by defendants of their duties as owners and possessors of the adjoining property rather than an alleged violation of defendants' duties as lessors.

Another claim of the defendants was that the plaintiffs and their parents assumed as a matter of law the risk of being bitten by rats inasmuch as they continued to occupy the premises from June to October. According to the court, it seemed certain that it could not be said as a matter of law from the plaintiffs' allegations that the plaintiffs, aged 2 and 3 years, respectively, assumed the risk involved here. If it could be said that the allegations showed that the parents assumed the risk, such assumption by them "should not be permitted to affect the rights of their minor children. * * * the assumption of risk by parents should not be held to preclude a recovery by a minor child on his own behalf."

The lower court's judgment was reversed with directions to overrule the defendants' demurrer.

—*Public Health Reports.*

Combating a Weevil

"Dust" Breaks Grain Insect's Film of Waterproof Fat, Dries It Up

Prof. H. V. A. Briscoe recently told the Royal Society of Arts that the Department of Inorganic and Physical Chemistry at Imperial College, London, has been experimenting with mineral powders which combated the grain weevil and which were entirely removed by the normal cleaning processes prior to milling, according to the N. Y. Times. The method has not come into general use largely because it is not thoroughly understood.

Professor Briscoe and his co-workers, Dr. J. A. Kitchener and P. Alexander, found that the chemical nature of the dust was immaterial, and that its action depended chiefly on its power to promote evaporation of body moisture from the insects. The weevil's greatest problem in life is the conservation of water, because it lives entirely on dry foods. Weevils that enter grain treated with dust die within a few days instead of living and propagating for months.

The weevil has a "waterproof" fatty film on its relatively pervious shell. Contact with hard, sharp, crystalline particles breaks the film. Drying of the insect naturally follows.

PCO Snapshots from the Purdue Conference

1—PCO Players in "Mr. Careless and Mr. Careful."
Left to Right—Messrs. Medoff, Mills, Wimmer, Bowers.
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2—Pres. George R. Elliott.

3.—Audience reaction to skit "Mr. Careless and Mr. Careful."

4—Prof. A. I. Bourne, Mass. Agric. Experiment Station.

5—J. E. Sameth speaking on "Research Projects with Emphasis on Moths."

6—Dr. Hugh P. Baker, Pres. Mass. State College.

7—Dr. F. J. Sievers, director of Mass. Agric. Experiment Station.

Pictures furnished through the courtesy of John K. Medoff, J. Edwin Sameth and Jerome Straus.

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Additional Patents Relating to Pest Control

By Dr. R. C. Roark

2,330,340 (Sept. 28, 1943; appl. May 16, 1942). INSECTICIDE. Curtis E. Dieter, George E. Lynn, and Bernard J. Thiegs, Midland, Mich.—The Dow Chemical Company, Midland, Mich.—The patentees claim an insecticidal composition comprising di-(4-chloro-phenoxy)-methane and a phenothioxin compound as active toxicants.

2,327,338 (Aug. 24, 1943; appl. Dec. 13, 1939). INSECT CONTROL. Thomas S. Carswell, Longmeadow, Mass.—Monsanto Chemical Company, St. Louis, Mo.—The patentee claims a mothicide and ambrosiacide which comprises an alkoxypolychlorobenzene of the formula C_6H_4 (O-alkyl)(C1n) in which n is a whole number greater than two. An example is the butyl ether of pentachlorophenol.

2,325,753 (Aug. 3, 1943; appl. Jan. 2, 1941). METHOD OF MAKING DINITRO CRESOL. Maurice L. Dolt, Plainfield, and Alfred G. Hill, North Branch, N. J.—American Cyanamid Company, New York, N. Y.—A method of preparing dinitro-o-cresol includes forming a cresol sulfonation mixture from concentrated sulfuric acid and ortho cresol, adding the sulfonation mixture to dilute nitric acid at room temperature with agitation while allowing the temperature to rise to substantially 40° C., thereafter heating the mixture to from 80° C. to 100° C., and subsequently isolating the dinitro-o-cresol.

2,325,808 (August 3, 1943; appl. October 23, 1941). GARBAGE CAN. Michael T. Stephansko, Chicago, Ill.—One-half to John Miska, Chicago, Ill.—This can has a perforated receptacle for containing a disinfectant, preferably naphalene for dispelling odors.

2,325,809 (August 3, 1943; appl. October 23, 1941). DISINFECTANT RECEPTACLE FOR GARBAGE CANS. Michael T. Stephansko, Chicago, Ill.—One-half to John Miska, Chicago, Ill.

2,326,601 (August 10, 1943; appl. January 7, 1939). APPARATUS FOR PRODUCING OZONE. John H. Arff, Portland, Oreg.—Rayozone Products Corporation, Portland, Oreg.

2,326,643 (August 10, 1943; appl. August 20, 1941). COMPLEX POLYAMINO SULPHUR COMPOUND. William F. Hester, Drexel Hill, Pa.—Rohm & Haas Company, Philadelphia, Pa.—The patentee claims the reaction products obtained by combining ethylene diamine with at least two molecular proportions of carbon disulphide in the presence of a base to form a bisdithiocarbamate and reacting said bisdithiocarbamate with sulphur chloride. Against the larvae of the Mexican bean beetle a control of 86 percent is obtained with a 1 percent spray using the reaction product of ethylene diamine, carbon disulphide, and sulphur chloride. The comparable product from propylene diamine gave a control of 92 percent at 1 percent and of 80 percent at 0.5 percent, while the comparable product from piperazine at 1 percent gave a control of 76 percent, compared to a control of 70 percent for a 1 percent magnesium arsenate. These products are also fungicides.

2,326,702 (August 10, 1943; appl. December 23, 1940). ETHERS. Fred Lowell Taylor and Clarence L. Moyle, Midland, Mich.—The Dow Chemical Company, Midland, Mich.—An example of these ethers is Beta-[(ortho,para-dichloro-alpha-phenylethyl)-phenoxy]-beta'-chloro-diethyl ether. Certain of the compounds have valuable properties as insecticidal toxicants.

2,326,845 (August 17, 1943; appl. February 10, 1942). INSECT CATCHER. Harry R. Etzler, Mount Clemens, Mich.

2,327,560 (August 24, 1943; appl. June 17, 1941). POWDER DISPENSER. William H. Rose, Jersey City, N. Y.—This powder spraying device is operatable with one hand.

2,327,871 (August 24, 1943; appl. July 3, 1940). CEDAR CHEST. Ernest C. Crocker, Belmont, Mass.—The Lane Company, Inc.

2,327,105 (August 17, 1943; appl. May 8, 1940). PEST CONTROL. Hubert G. Guy, Newark, Del.—E. I. du Pont de Nemours & Company, Wilmington, Del.—The patentee claims a self-dispersible composition comprising a substantially anhydrous liquid vehicle containing in clear solution rotenone, tetraethylthiuram monosulfide and an amine salt of a higher alcohol sulfate, said vehicle being constituted principally of plant spray oil and containing brown camphor oil and a water-insoluble liquid alcohol in the amounts required to blend and solubilize the rotenone and the amine salt in said oil.

Re. 22,393 (Reissued Nov. 23, 1943; appl. April 26, 1943). PROCESS OF PRODUCING WOOD PRESERVATIVES. Jacquelin E. Harvey, Jr., Washington, D. C.—Southern Wood Preserving Company, East Point, Ga.—The invention relates to the production of wood preservatives by treatment of tars, such as coal tar, gas house tar, low temperature tar, water gas tar, blast furnace tar, lignite tar, wood tar, pine tar and oils, rosin, rosin oil, fractions and residues derived therefrom, including pitches with hydrogen.

2,334,253 (Nov. 16, 1943; appl. March 13, 1942). LIQUID DISPENSER. Wayne K. Davis, Berkeley, Calif.—This invention relates to liquid dispensers for use in connection with the control of wood-infesting pests, such as termites and other wood borers, and fungus growths.

2,335,384 (Nov. 30, 1943; appl. April 24, 1940). PEST CONTROL. Euclid W. Bousquet, James E. Kirby and Norman E. Searle, Wilmington, Del.—E. I. du Pont de Nemours & Company, Wilmington, Del.—The patentees claim a pest control composition contains as an essential active ingredient a compound containing the nitroethylene structure.

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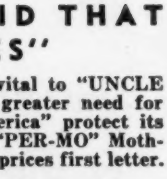

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MOTHPROOF LIQUID THAT "PENETRATES"

Now that woolen conservation is so vital to "UNCLE SAM'S" war program, there is still greater need for Moth protection. You can help "America" protect its valuable woolen materials by selling "PER-MO" Mothproofing Service. Full particulars and prices first letter.

PER-MO MOTHPROOF CO.
3729 Virginia, Dept. M. Kansas City, Mo.

Formulation of Rat Baits

(Continued from Page 18)

Fats in general are more difficult to obtain under present conditions where fresh animal fats are either left on the "ham" or salvaged for munition manufacture, and vegetable oils are stringently rationed. Due to the rather general use of fresh pork fat in some of our most widely used formulas, it seems justifiable to assume that industrial rations would permit most firms to acquire small supplies. As a typical formula, two pounds of fresh pork backfat is ground and mixed with one pound of fortified red squill powder. This is then blended with seven pounds of bread crumbs, and three ounces of cod liver or sardine oil are added. Many different fish oils have been used in various experimental products, and a curious observation has been made. It is easy to use too much. Five per cent of most of the oils caused a definite detrimental effect on acceptance. Even though fish oils are food elements, it seems that they are valuable in rat baits primarily for their "lure" value. As a consequence of the fat and oil shortage, more attention is being paid to the unrationed plant oils such as peanut, linseed and soybean oils. Raw linseed oil, when present in from 3-5 per cent of the weight of the entire bait, has given good results. Peanut oil is inferior to peanut butter, and the same thing is true of soybean oil being less satisfactory than soybean lecithin.

In the field of carbohydrates such products as sugars, syrups and jellies are being used as additive ingredients only, and not as major portions of any baits. Research on these products has not been extensive so no conclusive statements can be made.

Baits which are composed of natural products containing mixtures of the three major food elements have been in use for many years. Fresh foods, such as cantaloupes, sweet potatoes, grapes, apples, lettuce, tomatoes and the like, make highly attractive baits when used under the proper conditions, and because of their easy availability are being used more and more widely. White bread, which is a blend of all the major elements, has proved to be one of the best rat poison carriers. Recent observations made first by a representative of the pest control industry, have suggested the need for specifications as to what is acceptable white bread. Experiments have shown that the stream-lined wartime bread is much less attractive than was the old prewar variety. The quality of the ingredients, and baking technique have both been varied as war shortages of food substances and manpower developed. And the rats have noticed the difference—and do not seem to like the change. The answer to the problem from the practical viewpoint is to buy bread on specification—probably at a premium—from the smaller bakeries which can afford to do such specialty business.

Since shipping shortages have forced the attention of food processors to dehydration and other forms of food condensing, a variety of new concentrates are appearing on the market. Such substances as raisins, dried apples and certain jellies have been known and used for some years in rat and mouse baits, but the possibilities which may be present in the newer apple concentrates, the desiccated sweet potatoes and other vegetable products are just being studied.

During wartime it will be impossible to obtain any large quantities of rationed canned goods, but there are two or three possible bait ingredients which should be mentioned because of a unique source of supply which will be available to many of the firms in the industry.

SOME IMMEDIATE ANSWERS TO YOUR SUPPLY PROBLEM!

Super Fluorex V (White and Tinted)

Fluorides

Thallium and Other Poison Seeds

Bedbug Sprays and Concentrates

*Pyrofine—(Insecticide Concentrate)

Pyrethrum—Limited Quantities

*Blendum Powder—(Replacement for Pyrethrum Mixing Powder)

*Pyrethrum B.G. Powder Insecticide

Red Squill Powder

Roach Powder

Sterilan Mothproofing Powder

Supply limited; order promptly!

*No priority required.

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POWCO BRAND products are sold *only* to insecticide manufacturers and Pest Control Operators.

JOHN POWELL & CO.

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BUY . . . . . U. S. War Bonds and Stamps

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87-101 Ferry St.
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Start The New Year Right . . . . USE
HOUCHIN'S INSECT POWDER DUSTERS

No. 980 "DEFENDER"

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Established Money Saver for the PCO

Diamylphenol

BEDBUG, CARPET BEETLE AND
DOG TICK SPRAY CONCENTRATE

DIAMYLPHENOL is a heavy oily liquid, substantially free of COLOR and free of ODOR. Diamylphenol is ECONOMICAL and has a QUICK kill.

DIAMYLPHENOL is miscible in oil base in all proportions. It is used as an odorless alternate material for phenol or cresol in bedbug sprays.

DIAMYLPHENOL is usually used at a dilution of 1-100 or 1% spray base oil. Numerous operators have reported good results using 1½% against BROWN DOG TICKS and CARPET BEETLES.

G. L. HOCKENYOS, Inc.
REISCH BLDG., SPRINGFIELD, ILL.

NOW YOU CAN BUY

4 to1 Concentrate
FOR RATS AND MICE

(Just Dilute With Water)

Per-Mo Rat and Mice Exterminating Liquid can be used as a drink or can be mixed with any food and used as a bait.

Economical to use and a "Guaranteed" Rodent Exterminator.

Send $1.00 for a 16-oz. Bottle CONCENTRATE RAT & MICE EXTERMINATING LIQUID. Postage Prepaid.

PER-MO MOTHPROOF CO.
3729 Virginia Ave. Dept. R Kansas City, Mo.

Phosphorus Paste

10 lbs., $4.25; 25 lbs., $9.
50 lbs., $17; 100 lbs., $32.50.

For the extermination of rats and roaches.

PEST CONTROL CHEMICALS CO.
P. O. Box 37 *Write for Details* BUFFALO, N. Y.

Tomato puree and tomato catsup have been shown to be particularly useful rat baits, either used alone or mixed with bread crumbs, and blended with thallium, arsenic or red squill. As these products are made from field grown crops which are particularly susceptible to insect contamination, the U. S. Food, Drug and Insecticide Administration maintains careful control on the commercial "Packs." Often extensive seizures of these tomato-bearing materials are made when they have been proved to be unfit for human consumption. The Government would probably permit the sale of such condemned goods for use in rat control. The same procedure would be true of other condemned products, and since there are 16 laboratories of the Food and Drug Administration stratigically located throughout the country, it would be well for the pest control industry to investigate the possibilities through the closest laboratory of that agency. Another source of rat bait is one which many of your operators are using already, and that is through the larger groceries where slightly swelled cans of various foods unsuited for human consumption will be set aside for use in rat control. One important point bearing on this practice must be kept in mind, however. Rats do not like badly tainted food and its use is merely a waste of poison and manpower and serves to educate the animals.

One suggestion must be emphasized in any discussion of rat control methods during wartime, and that is that the practice of prebaiting will pay dividends. That is particularly true where the less attractive and effective foods are used, and where some of the newer and expensive poisons are employed. In every instance where difficulty has been experienced in previous poisoning trials, prebaiting should be employed as a routine procedure before another poison treatment. If the less well-taken rat foods are the only ones available for use, prebait should be used before the first poison exposure. England has adopted a policy of prebaiting ahead of rat poison formulas which would certainly not be effective if used alone. The same thing is true in the sugar cane fields of the Hawaiian Islands. Prebaiting has proved to be essential under certain conditions, and valuable under a wide variety of circumstances. If you have a particularly difficult situation, try prebaiting.

In conclusion, it may be stated that research to find new rodenticides is being emphasized during wartime, with a great deal of attention being given to the field of synthetic organic chemicals. If the accomplishments in new insecticides can be used as an indication, this line of research should be most fruitful. Experiments to learn how to employ poisons that are still available are also being stressed, since the most rapid benefits will come from the results from these studies.

* Before Natl. Pest Control Assn., St. Louis, Oct. 26.

Soda Cyanide Under Allocation February 1

Issuance of order M-366 placing cyanide under complete allocation effective February 1 was announced January 7 by the Chemicals Division of the War Production Board.

The order, which defines cyanide as "all grades and mixtures of sodium cyanide and solutions of sodium cyanide which contain 20 per cent or more cyanide by weight" provides that on and after February 1, no deliveries may be made or accepted, nor can a supplier use more than 1,000 pounds of cyanide (computed on 96 per cent basis) in any one month without specific authorization of the WPB.

Suppliers are required to seek authorization to make deliveries on form WPB 2946 which must be filed before the 20th day of the month preceding the month of delivery. Users must make application on form WPB 2945 by the fifteenth day of the month preceding the month of delivery.

WPB authorization is not necessary in the case of deliveries of 1,000 pounds or less (computed on a 96 per cent basis) if acceptance of delivery will not cause his inventory to exceed 200 pounds or a 45-day supply whichever is greater.

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The latest helpful information service literature will be sent to you without cost or obligation. If, in addition, there are any particular pieces of literature offered by advertisers in this issue you are interested in receiving, either write them direct, or if you prefer, please send us such requests.

Please note, however, that you must request each booklet on a separate letterhead though they may all be mailed in one envelope addressed to Pests, 126 Lexington Avenue, New York City, N. Y.

SPECIAL ROACH POWDER

Circular describes a roach powder (containing Lethane A 70) which, it is stated, is fast acting, positive in kill and will not deteriorate for at least eight weeks after application. As a result, the supplier points out, the PCO does not have to service his customers as often, thereby conserving manpower. Moreover, it is stated, the powder is non-toxic to warm blooded animals and may, therefore, be used in dairies, packing and food handling plants, homes, etc., in fact, in all places where sodium fluoride mixtures may not be used. . . . Described also is a sodium fluoride-Pyrane formulation for the PCO who wishes to make his own roach powder.

WRITE PESTS—Bosley.

SODIUM SILICO FLUORIDE

Bulletin describes sodium silico fluoride product with proper density. Effective manner of testing for presence of HCN after ventilation also discussed.

WRITE PESTS—AC 70.

MILITARY FUMIGATION MANUAL

This special 48 page manual has been prepared for the benefit of officers and civilians in the Armed Forces who are responsible for vermin control, and for PCOs who may contract with the Armed Forces for fumigating work. Among other subjects, the manual discusses: dosage, preparation of building for fumigation, fumigation operation, common pests, cockroach control; precautions, first aid methods, etc.

WRITE PESTS—AC.

TERMITE CONTROL

Folder discusses concentrates available for two distinct methods of termite control: (1) treatment of timbers in place with an oil solution, and (2) treatment of all soil around an infested building or area with either an oil or water soluble chemical. Issuing company states it specializes in all problems concerning wood-destroying organisms and also wood preservation and invites your inquiries thereto.

WRITE PESTS—WOOD.

FUMIGATION SAFETY SUGGESTIONS

Of timely interest, in view of the at-hand fumigation season, is this bulletin which advocates as a safety measure the use of methyl orange-mercuric chloride test papers for the presence of HCN. It also discusses can openers for Zyklon Discoids, the need for adequate ventilation after fumigations, and gives a cautionary note on pilot lights in premises to be fumigated.

WRITE PESTS—AMERICAN.

STERILIZING GAS MASKS

News bulletin describes a chemical that is claimed by the manufacturer to be effective in sterilization of gas masks. Bulletin also discusses antidotes and first aid, particularly an inhalant which functions best as an antidote to HCN poisoning, and where obtainable.

WRITE PESTS—A-C-73

FUMIGATION AND PLASTICS

News release discusses use-co-ordination of such diverse chemical products as plastics and fumigants in connection with infested bagged grain, seed, packaged or boxed foodstuffs. Methyl bromide-plastic-tarpaulin method of disinfestation described.

WRITE PESTS—DOW

HOUSEHOLD SPRAY FACTS

Manufacturer's bulletin discusses Lethane's killing power, range of insect control, cost, chemical stability, spray formulas, etc.

WRITE PESTS—ROHM & HAAS.

PYRETHRUM - DERRIS - RED SQUILL PRODUCTS

Leaflet describes foregoing insecticides with special bait chart for use in connection with powdered red squill.

WRITE PESTS—PRENTISS.

SOLVAY PRODUCTS

48-page booklet in colors and illustrated, covering their entire line of Alkalies and Special Products, with a special section dealing with Para-Dichlorobenzene and Ortho-Dichlorobenzene.

FREE COPY MAY BE HAD BY PEST CONTROL OPERATORS. WRITE SOLVAY, c/o PESTS.

DEODORANT

Catalog includes price data, etc., on deodorant which it is felt can neutralize and deodorize such toxic agents as Thanite, Lethane 384 Special, Velsicol, etc. Also contains data on perfume oils for sprays made with pyrethrum and kerosene.

WRITE PESTS—MAGNUS.

FUMIGATION NOTES:

Discusses spread of Discoids; reinfestation; effects on vegetables and eggs.

WRITE PESTS, AC58.

ELECTRIC FANS

Bulletin discusses value of electric fans in connection with fumigation work, also some pertinent thoughts on the Schafer Prone Pressure Method of Resuscitation, etc.

WRITE PESTS—AC-69.

MOLE KILLER PELLETS

Circular describes mole killer pellets which manufacturer states requires no traps, no gas, no exposed poison. Diagram of runways and explains how mole lives. Testimonial letters.

WRITE PESTS—CARAJON.

PRESERVATION OF MILLWORK AND OTHER DRY WOOD PRODUCTS

Bulletin discusses composition of Permatox B Concentrate and its application in the preservation of millwork and other dry wood products.

WRITE PESTS—Permatox 43-B.

INSECT COLLECTIONS

Booklets describes pocket display case which may slip easily into a coat pocket making it of value for salesmen or others who travel about. Life history collections of structural type pests are also available for the PCO.

WRITE PESTS—Ward's.

SAFETY IN FUMIGATION WORK

Fumigation Safety Rule No. 1, namely "Vacate entire building even though only part is fumigated, as well as adjoining buildings into which gas may penetrate" is discussed in this bulletin.

WRITE PESTS—AC No. 78.

PIGEON-PROOFING

Folder describes pigeon-proofing invention which manufacturer claims will completely and decisively eliminate the pigeon nuisance. In use by real estate companies, churches, government buildings, etc.

WRITE PESTS—STANLEY.

CONTROL OF TERMITES-POWDER-POST (LYCTUS) BEETLES-DECAY

Circular discusses properties and uses of Permatox A in termite control and its application to soil and wood to control termites, decay control, powder-post beetle prevention and control. Description of Permatox T and its uses in termite control, as a soil poison, are also discussed, together with toxicity.

WRITE PESTS—BULLETIN 43-T.

BOX CAR FUMIGATION

Folder describes box car fumigation with methyl bromide, giving details as to: car seal, applicator arrangement, methyl bromide application, dosage, exposure period, temperature, aeration, precautions.

WRITE PESTS—DOW

Hydrocyanic Acid Poisoning—Skin Absorption

Bulletin discusses some pertinent safety suggestions with respect to avoidance of hydrocyanic acid poisoning through skin absorption.

WRITE PESTS A-C-74

BIRD REPELLENT

Circular describes product which manufacturer claims will serve as an effective repellent against pigeons, starlings, bats, dogs, cats, rats, mice, woodchucks, moles as well as crawling and flying insects that prey upon plantings and seedlings.

WRITE PESTS—PX

THE ACTIVATING EFFORT OF PYRETHRUM UPON THE GERMAN COCKROACH

Research material prepared by John M. Hutzel, of the Ohio State University, Columbus, Ohio in cooperation with the Kenya Pyrethrum Extension Service, Inc., N. Y. Supervised by Professor F. L. Campbell.

WRITE PESTS—PYRETHRUM.

PRESERVATION OF LUMBER, POLES, POSTS, PLYWOOD WITH PENTACHLORPHENOL

This bulletin gives a brief summary of the properties, use to date, and recommendations for the preservative treatment of lumber, poles, posts, and other forest products with Permatox A. This product, it is stated, has shown outstanding promise as an effective and permanent oil preservative for many wood products. Set forth briefly also, are recommendations for the effective preservative treatment of lumber, poles, posts, and other forest products with Permatox A, based upon experience to date.

WRITE PESTS—BULLETIN 43-A.

Local Organization News

(Continued from Page 20)

lowed, S. T. Brown, Field Representative Hotel and Restaurant Division, State Board of Health, emphasized the advantages of the educational approach in the enforcement of sanitary laws that must be obeyed by restaurant and hotel management over the out-and-out police method of law enforcement. Mr. Brown punctuated his viewpoint with pertinent illustrations of the educational approach.

Novel and interesting, and especially because it was rooted in actuality, was Dr. E. R. Krumbiegel's aproach to the "Relationship of Pests to Health." While not gainsaying the menace of known insect and rodent pests to public health, Milwaukee's Health Commissioner directed attention to other aspects of the lack of adequate pest control to public health not generally ascribed to insects which, so far as is known, are not actual disease vectors. For example, he noted there is the offense to sanitary decency. Bedbugs disturb sleep; roaches effect the appetite; parents do not permit their children to play in the sunshine for fear that they may be bitten by rats seen in the home area; accidents caused by people chasing a moth miller seen in the parlor; ants in the home cause social embarrassment, etc.

Continuing, Dr. Krumbiegel warned that control remedies oft-times more obnoxious and harmful than to subject one's self to these insects but nevertheless there was no excuse for their being tolerated. Advocated legislation to help minimize control remedy accidents.

"Regulatory Work in Entomology and Pest Control" was discussed by E. L. Chambers, State Entomologist, Madison, Wis.; while J. A. Lippert, of the Milwaukee Building Owners & Managers Association, gave a "Building Operator's Slant on Pest Control", which he introduced with a unique telephone call. . . . Stressing the fact that business management is looked upon at times as being too hard boiled with regard to making price an emphasis, he noted in addition that the PCO would do himself a favor if he made occasional reports to management when unusual unsanitary conditions are found. He made it clear that management is just as much interested in vermin-free apartments as anyone else. There would be far more cooperation, Mr. Lippert believed, between management and the pest control industry if such progress reports were made. Deploring the lack of recognized standards in and among PCOs, he urged that they learn to talk the same language.

A film made in San Francisco, "Insects Versus Man—A Never-Ending War", next on the program, proved of educational value, especially since it dealt in part with rat problems. It showed, for instance, the dissection of a rat infected with bubonic plague and the manner in which the deadly germ is carried by the flea from rat to human.

The organizational means to be employed if a rodent control program is to be set up was the essence of F. E. Garlough's talk, "Cooperative Rat Control Problem." Outlining the need for a permanent organization, if a program against the rat is to be effective, he urged that its composition be approximately as follows:

A. City Rat Control Organization Chart
  I. Advisory Rat Control Committee
    A. Director of City Health Department
      a. Superintendent of Rat Control
        1. Educational division
        2. Surveys division
        3. Garbage disposal and harborage removal division
        4. Vent stoppage and ratproofing division.
        5. Reduction of rat population division

B. Procedure in Control Methods
  1. Survey of rat conditions should be made
  2. The city should be divided into zones suitable for efefctive work
  3. Combination of control methods should be used
  4. For large scale control operations, poisoning and fumigation should be used along with preventive measures, followed by trapping.

(Mr. Garlough is Senior Biologist, Division of Predator and Rodent Control, Fish and Wildlife Service, U. S. D-1, Chicago, Ill.)

A meeting sidelight of more than passing interest was an excellent display of photos showing insect and rodent destruction. These were made available largely through the photographic efforts and abilities of Harvey Klein, Klein Exterminating Co., Milwaukee, and others.

Guests of honor include: Mr. and Mrs. Charles R. Jackson, U. S. Naval Training Station Building 95, Sanitation, Great Lakes, Ill.; Walter McCloud, past president NPCA; C. Norman Dold, past president NPCA, both of Chicago; Dr. S. L. Pilgrim, Chief, Bureau of Food and Sanitation, Milwaukee; Dr. S. C. Mount, Assistant Chief in Charge of Milk Inspection, Milwaukee; Lt. A. Kowald, Lt. in Charge Sanitation, Milwaukee; Rev. John Lewis, Pastor Calvary Presbyterian Church, Milwaukee; Ray Sullivan, Health Office, Shorewood, Wis.

Among the 87 present were:

Patrick H. Maloney, Bay Exterminating Co., Green Bay, Wis.
Jack O'Leary, Bay Ext. & Fumigators, Milwaukee.
Harry J. Hammond, Sr., Hammond & Son, Inc., Milwaukee.
Harry J. Hammond, Jr., Hammond & Son, Inc., Milwaukee.
Alfread A. Krueger, Hammond & Son, Inc., Milwaukee.
Robert Radig, Hammond & Son, Inc., Milwaukee.
Erwin Paris, Hammond & Son, Inc., Milwaukee.
Henry Grazmehle, Hammond & Son, Inc., Milwaukee.
Mrs. Nellie K. Krueger, Hammond & Son, Inc., Milwaukee.
Harvey W. Klein, Klein Exterminating Co., Milwaukee.
Ellsworth Klein, Klein Exterminating Co., Milwaukee.
George Klein, Klein Exterminating Co., Milwaukee.
Ora Hepburn, Klein Exterminating Co., Milwaukee.
H. Lies, Klein Exterminating Co., Milwaukee.
Robert Salmon, Klein Exterminating Co., Milwaukee.
I. C. Barager, Exito Chemical Co., Eau Claire, Wis.
C. B. Lien, Lien Chemical Co., Chicago, Ill.
Walter H. Last, Last Pest Control Co., Milwaukee.
Alex Last, Last Pest Control Co., Milwaukee.
Mrs. Clara Stillmaker, Last Pest Control Co., Milwaukee.
John Kourt, Milwaukee Fumg. & Extc. Co., Milwaukee.
Howard Johnson, Owl Exterminating Co., Racine, Wis.
Carl F. Knobla, Oshkosh, Wis.
Richard J. Murray, Robertson Exterminating Co., Milwaukee.
Kenneth McCue, Robertson Exterminating Co., Milwaukee.
Lawrence Greenwood, Robertson Exterminating Co., Milwaukee.
Elmer Mieritz, Robertson Exterminating Co., Milwaukee.
Mrs. Richard J. Murray, Robertson Exterminating Co., Milwaukee.
Henry Turrie, Wil-Kil, Milwaukee.
William Turrie, Wil-Kil, Milwaukee.
Ira Benedict, Wil-Kill, Milwaukee.
Elmer Bergemann, Wil-Kil, Milwaukee.
Charles Buwe, Wil-Kil, Milwaukee.
Glen Walker, Wil-Kil, Milwaukee.
Rola M. Paulsen, Wil-Kil, Milwaukee.
Alice Tyra, Wil-Kil, Milwaukee.
B. C. Culver, American Cyanamid & Chemical Corp.
Dr. G. Chapman, American Cyanamid & Chemical Corp.
Mr. Jordan, Arab Pest Control, Indianapolis, Ind.
Mr. J. J. Code, H. D. Hudson Mfg. Co., Chicago, Ill.
Mr. H. E. Jones, Wadhams Oil Co.
Mr. C. R. Gruel, Wadhams Oil Co.
Mr. G. C. Van Horn, Wadhams Oil Co.
Mr. Ed. Riedeburg, Dow Chemical Co.

Chicago PCOs Meet

Problems of the Industry, with specific emphasis on the critical manpower shortage, were discussed by Secretary William O. Buettner and President George Elliott at the Hotel Sherman on January 21, 1944. There were 34 present. Presiding was C. Norman Dold.

With Walter McCloud and Morton Prescott leading the discussions, the remainder of the meeting was devoted to plans for the forthcoming "12th Annual Business Meeting" of the N.P.C.A., to be held at the Sherman in Chicago, October 23, 24, 25. In attendance were:

Ben Federman, Shur-Deth Exterminating Co.
Henry F. Leopald, Shur-Deth Exterminating Co.
H. C. Kaufman, Pesticide Co.
H. F. DeLonge, City Exterminating Co.
Elmer Kuntz, Lien Chemical Co.
C. B. Lien, Lien Chemical Co.
J. R. Franklin, Hammond Exterminating Co.
Laehl Milton, Aqua-Fume Exterminating Co.
Joseph Tiegen, A. Sanitary Service Co.
Louis L. Paul, Nueva Fumigating Co.
Samuel Grossman, A. N. D. Exterminating Co.
A. Kapson, A. & B. Exterminating Co.
F. Luoscow, Scientific Exterminating Co.
L. D. Postel,(A.B.C. Exterminating Co.
Jules B. Smith, A-Veri-Best Exterminating Co.
Victor C. Neuman, Certified Exterminating Co.
Arthur B. Tronsen, A. Armitage Pest Control.
Vernon Perfect, Gets All Insect Control.
Mr. and Mrs. R. E. Brawner, Thirteen Insect Exterminating Co.
Stanley L. Lind, American Laboratories, Inc.
C. Norman Dold, Rose Exterminating Co.
Mr. and Mrs. Clyde Renfroe, Renfroe Exterminating Service.
Joseph DeFiore, A-Globe Exterminating Co.
Morton S. Prescott, Pratex Service.
Walter S. McCloud, W. B. McCloud & Co.
Arthur Srebren, Associated Chemists, Inc.
Mr. and Mrs. A. E. Clark, Chicago Exterminating Co.
Al Stone, Stone Chemical Co.
Dave Lynch, John Powell & Co.
George E. Hoffman, Ento Pest Control.
T. E. Woods, W. B. McCloud & Co.
Earl Solomon, Fred Peres Co.
William O. Buettner, Brooklyn (Sec.).
Geo. E. Elliott, Worcester (Pres.).

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New fumigation operations open big field!

DOW PRODUCTS—EASILY HANDLED—SIMPLY APPLIED

—POINT WAY TO PROFITABLE BUSINESS FOR YOU

Greater opportunities for increasing your fumigation service are opening up. The need for professional aid in many types of industrial fumigations is greater than ever before. With Dow Methyl Bromide, you can easily handle important jobs in the food fumigation field with a minimum of labor. Effective results may be obtained with short exposure periods, of only a few hours, if the proper dosage is used. Aeration is exceedingly rapid so that the total time involved in completing the fumigation work may be greatly shortened, enabling you to serve a larger number of customers with the same personnel. You will find that Methyl Bromide acts with impressive thoroughness—penetrating the largest bags or packages—and kills insects in every stage of development. Look at the new business opportunities listed below; then write to Dow for complete details on Methyl Bromide and other Dow fumigant products.

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Cleveland • Detroit • Chicago
St. Louis • Houston • San Francisco • Los Angeles • Seattle

Look at these opportunities!

TARPAULIN

With Methyl Bromide, you can handle "on the spot" fumigations. This will give you the advantages of a portable fumigation chamber—yet requires very little equipment.

WAREHOUSE

Both Methyl Bromide and Dow Chloropicrin meet warehouse needs. Chloropicrin will serve you well in buildings that cannot be thoroughly sealed.

BOX CAR

Fumigate loaded box cars for local firms. Methyl Bromide is better suited for this job than any other material. Make it one of your "Special Services."

METHYL BROMIDE

the penetrating fumigant

Other Dow Fumigants include: **CHLOROPICRIN, CARBON TETRACHLORIDE, ETHYLENE DICHLORIDE, PROPYLENE DICHLORIDE AND CARBON BISULPHIDE.**

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CHEMICALS INDISPENSABLE TO INDUSTRY AND VICTORY

BE SURE

Of the concentrate you use in your bed-bug liquid.

...SURE that the concentrate you use is effective.

...SURE that you will get the concentrate when you need it.

You Are **SURE** *With*

MORTICIDE

Diluted one part of Morticide with 24 parts of insecticide base oil, Morticide gives you a highly effective spray against bed-bugs, roaches and other crawling insects.

Morticide is economical. The initial cost of Morticide is less than that of any standard insecticide concentrate.

There are no restrictions on the civilian use of Morticide. No priorities or allocations. We are now accepting contracts for 1944 delivery. Cover your requirements for the year with us NOW.

If you need an entirely odorless spray use

SUPER MORTICIDE

The dilution is the same. The cost but a fraction more.

HI TOX 20
for
FLY AND CATTLE SPRAYS

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for
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We also supply Assco Roach Powder, Assco Rat Paste, Sodium Fluoride, etc.

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